

## STATE OF SOUTH CAROLINA

## (Caption of Case)

Petition of South Carolina Electric & Gas Company  
for Updates and Revisions to Schedules to the  
Construction of a Nuclear Base Load Generation  
Facility at Jenkinsville, South Carolina

BEFORE THE  
PUBLIC SERVICE COMMISSION  
OF SOUTH CAROLINA  
COVER SHEET

DOCKET

NUMBER: 2012 - 203 - E

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**DOCKETING INFORMATION** (Check all that apply)

☐ Emergency Relief demanded in petition ☐ Request for item to be placed on Commission's Agenda expeditiously

☐ Other: \_\_\_\_\_

INDUSTRY (Check one)	NATURE OF ACTION (Check all that apply)		
<input checked="" type="checkbox"/> Electric	<input type="checkbox"/> Affidavit	<input type="checkbox"/> Letter	<input type="checkbox"/> Request
<input type="checkbox"/> Electric/Gas	<input type="checkbox"/> Agreement	<input type="checkbox"/> Memorandum	<input type="checkbox"/> Request for Certificatio
<input type="checkbox"/> Electric/Telecommunications	<input type="checkbox"/> Answer	<input type="checkbox"/> Motion	<input type="checkbox"/> Request for Investigator
<input type="checkbox"/> Electric/Water	<input type="checkbox"/> Appellate Review	<input type="checkbox"/> Objection	<input type="checkbox"/> Resale Agreement
<input type="checkbox"/> Electric/Water/Telecom.	<input type="checkbox"/> Application	<input type="checkbox"/> Petition	<input type="checkbox"/> Resale Amendment
<input type="checkbox"/> Electric/Water/Sewer	<input type="checkbox"/> Brief	<input type="checkbox"/> Petition for Reconsideration	<input type="checkbox"/> Reservation Letter
<input type="checkbox"/> Gas	<input type="checkbox"/> Certificate	<input type="checkbox"/> Petition for Rulemaking	<input type="checkbox"/> Response
<input type="checkbox"/> Railroad	<input type="checkbox"/> Comments	<input type="checkbox"/> Petition for Rule to Show Cause	<input type="checkbox"/> Response to Discovery
<input type="checkbox"/> Sewer	<input type="checkbox"/> Complaint	<input type="checkbox"/> Petition to Intervene	<input type="checkbox"/> Return to Petition
<input type="checkbox"/> Telecommunications	<input type="checkbox"/> Consent Order	<input type="checkbox"/> Petition to Intervene Out of Time	<input type="checkbox"/> Stipulation
<input type="checkbox"/> Transportation	<input type="checkbox"/> Discovery	<input checked="" type="checkbox"/> Prefiled Testimony	<input type="checkbox"/> Subpoena
<input type="checkbox"/> Water	<input checked="" type="checkbox"/> Exhibit	<input type="checkbox"/> Promotion	<input type="checkbox"/> Tariff
<input type="checkbox"/> Water/Sewer	<input type="checkbox"/> Expedited Consideration	<input type="checkbox"/> Proposed Order	<input type="checkbox"/> Other: <u>OK</u>
<input type="checkbox"/> Administrative Matter	<input type="checkbox"/> Interconnection Agreement	<input type="checkbox"/> Protest	
<input type="checkbox"/> Other:	<input type="checkbox"/> Interconnection Amendment	<input type="checkbox"/> Publisher's Affidavit	

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# ROBERT GUILD

*Attorney at Law*

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August 9, 2012

Ms. Jocelyn Boyd  
Chief Clerk  
Public Service Commission of South Carolina  
Post Office Drawer 11649  
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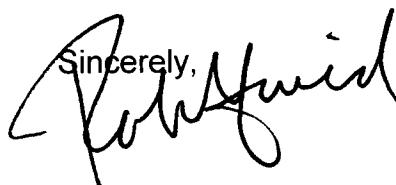
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In Re: Petition of South Carolina Electric & Gas Company for Updates and Revisions to  
Schedules Related to the Construction of a Nuclear Base Load Generation  
Facility at Jenkinsville, South Carolina  
Docket No. ~~2012-00-E~~

Dear Ms. Boyd::

Enclosed please find for filing and consideration the Direct Testimony and  
Exhibits of Dr. Mark Cooper on behalf of the Sierra Club in the above docket, together  
with Certificate of Service reflecting service upon all parties of record.

With kind regards I am

Sincerely,  


Robert Guild

Encl.s  
CC: All Parties

CERTIFICATE OF SERVICE

I hereby certify that on this date I served the above DIRECT TESTIMONY AND EXHIBITS OF DR.MARK COOPER by placing copies of same in the United States Mail, first-class postage prepaid, addressed to:

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August 9, 2012



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CERTIFICATE OF SERVICE

BEFORE THE  
SOUTH CAROLINA PUBLIC SERVICE COMMISSION  
DIRECT TESTIMONY  
OF  
DR.MARK COOPER  
ON BEHALF OF THE SIERRA CLUB  
DOCKET NO. 2012-203-E

**I. QUALIFICATIONS**

**Q. Please state your name and address.**

A. My name is Dr. Mark Cooper. I reside at 504 Highgate Terrace, Silver Spring, Maryland.

**Q. Briefly describe your qualifications**

A. I have a Ph.D. from Yale University and have been providing economic and policy analysis for energy and telecommunications for over thirty years. I have been the Director of Energy and the Director of Research at the Consumer Federation of America for 27 years, although the opinions I express in this testimony are my personal opinions and not those of the Consumer Federation. I am a Fellow at various universities on specific issues, including the Institute for Energy and the Environment at Vermont Law School. I have testified over 100 times before public utility commissions in 44 jurisdictions in the U.S. and Canada on energy and telecommunications issues and about twice as many times before federal agencies and Congress on a variety of issues, including energy and electricity. In the past few years I have testified on

nuclear construction cost issues before regulators and legislators at the federal and state levels in the U.S. and Canada and published papers and articles in professional journals.

**Q. Please describe your activity with respect to electricity economics and resource acquisition.**

**A.** One of the first public utility commission proceeding I participated in over a quarter of a century ago involved the prudence and economic viability of Grand Gulf 2.<sup>1</sup> The most recent proceedings I have testified in involved the same issues with respect to the Turkey Point and Levy reactors in Florida.<sup>2</sup> In the intervening years I have testified about and published numerous articles on nuclear economics,<sup>3</sup> natural gas,<sup>4</sup> energy efficiency,<sup>5</sup> renewables<sup>6</sup> and electricity restructuring.<sup>7</sup> My complete Curriculum Vitae is provided as Exhibit MNC-1.

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<sup>1</sup> "On Behalf of Mississippi Legal Services Coalition in the Matter of the Citation to Show Cause Why the Mississippi Power and Light Company and Middle South Energy Should not Adhere to the Representation Relied Upon by the Mississippi Public Service Commission in Determining the Need and Economic Justification for Additional Generating Capacity in the Form of A Rehearing on Certification of the Grand Gulf Nuclear Project," Before the Mississippi Public Service Commission, Docket No. U-4387, August 13, 1984

<sup>2</sup> "Direct Testimony of Dr. Mark N Cooper in Re: Nuclear Plant Cost Recovery for the Southern Alliance for Clear Energy," Before the Florida Public Service Commission, FPSC Docket No. 100009-EI, August 2010; "Direct Testimony of Dr. Mark N cooper in Re: Nuclear Plant Cost Recovery for the Southern Alliance for Clear Energy," Before the Florida Public Service Commission, FPSC Docket No. 090009-EI, July 15, 2009

<sup>3</sup> "Economic Advisability of Increasing Loan Guarantees for the Construction of Nuclear Power Plants," Domestic Policy Subcommittee, Committee on Oversight and Government Reform, U.S. House of Representatives, April 20, 2010

<sup>4</sup> "Energy Market Manipulation and Federal Enforcement Regimes," Committee On Commerce, Science And Transportation, United States Senate, June 3, 2008; "Direct Testimony Of Dr. Mark N. Cooper On Behalf Of The Attorney General Of Oklahoma, Before The Oklahoma Corporation Commission Application Of Ernest G. Johnson, Director Of The Public Utility Division, Oklahoma Corporation Commission, To Require Public Service Company of Oklahoma To Inform The Commission Regarding Planning Of Energy Procurement Practices And Risk Management Strategies And For A Determination As To Appropriate Methods To Lessen The Impact Of Energy Price Volatility Upon Consumers, Cause No. Pud 2001-00096, May 18, 2001

<sup>5</sup> "Building Energy Performance Standards," before the Subcommittee on Energy Regulation of the Committee on Energy and Natural Resources, United States Senate, June 26, 1980; "Prudent Resource Acquisition in a Complex Decision Making Environment: Multidimensional Analysis Highlights the Superiority of Efficiency," Current Approaches to Integrated Resource Planning, 2011 ACEEE National Conference on Energy Efficiency as a Resource, Denver, September 26, 2011

<sup>6</sup> Risk, Uncertainty and Ignorance: Analytic Tools for Least-Cost Strategies to Meet Electricity Needs in a Complex Age, Variable Renewable Energy and Natural Gas: Two Great Things that Go Together, or Best Not to Mix Them. NARUC Winter Committee Meetings, Energy Resources, Environment and Gas Committee, February 15, 2011

<sup>7</sup> "Initial Comments of the Consumer Federation of America," Remedying Undue Discrimination through Open Access Transmission Service and Standard Electricity Market Design, Federal Energy Regulatory Commission, Docket No. RM-01-12-000, October 15, 2002; "An Economic Explanation of Why the West and South Want to Avoid Being Infected by FERC's SMD and Why Market Monitoring is Not an Effective Cure for the Disease," SMD Market Metrics Conference, Federal Energy Regulatory Commission, October 2, 2002; "Reply Comments of the Consumer Federation Of America," before the Federal Energy Regulatory Commission, San Diego Gas & Electric Company, Complaint, v. All Sellers of Energy and Ancillary Services Into Markets Operated by the California Independent System Operator and the California Power Exchange, Docket Nos. EL00-95-000 et al, 2000;

## **II. PURPOSE AND OUTLINE OF THE TESTIMONY**

**Q. What is the purpose of your testimony?**

A. I have been asked by the Sierra Club to evaluate whether the cost overruns that South Carolina Electric and Gas (SCE&G, the company or the utility) seeks to recover from ratepayers are just, reasonable and prudent. My review examines the costs from the narrow perspective of the Base Load Review Act (BLRA) and the broad perspective of public utility regulation. I conclude that from both points of view the cost overruns are not prudent. Therefore they should not be recovered from SCE&G ratepayers.

**Q. Please describe the history of rate setting for this project under the BLRA that brought it to this point.**

A. While the BLRA represented a dramatic change in the way rates are set for new nuclear reactors built in South Carolina, it did not abandon the fundamental concepts of just, reasonable and prudent that govern the setting of utility rates. Advanced cost recovery under the BLRA gives nuclear costs very special treatment, but it is not a blank check and it does not diminish the obligation of the utility to ensure that it delivers the least cost electricity to ratepayers.

This cost overrun proceeding signals to the commission that the utility has failed to continue to practice the cost vigilance it is obligated to exercise. When the contingency cost pool that the Utility proposed in the initial BLRA proceeding (Docket NO. 2008-196-E) was rejected by the South Carolina Supreme Court, the utility quickly updated its cost estimate (Testimony of Kevin B. Marsh, Docket No. 2012-203-E) p. 7, pointing to Order No. 2011-345).

It took a second bite at the apple and chose to increase its cost estimate by \$174 million to establish a cost basis of \$4.3 billion.<sup>8</sup>

A mere two years later, it is back asking for another \$283 million, a cost increase of 6.6 percent. With this request, the cost overruns have now driven the total cost of the project above the original cost estimate plus the contingency cost pool. The BLRA requires a prudence review of the increase in costs and this is the moment for a thorough review of the cost and economic viability of the project.

**Q. Are the cost increases prudent from the narrow view of the BLRA?**

A. No, they are not. I show in my testimony that there are numerous ways in which the costs the utility now seeks to recover from ratepayers should have been anticipated in the original cost estimate, but were not or have been caused by actions of the utility or its vendors. Ratepayer should not be held responsible for the burden of these actions.

In addition, there is an even more fundamental reason that these costs should not be recovered from ratepayers – the overall project is no longer prudent. Although the BLRA gave nuclear reactor construction special treatment in the cost review process, it did not alter the underlying principles that allow recovery of only just, reasonable and prudent costs. The obligation that a project be prudent is continuous, not a one-shot determination. When economic conditions change projects that have become economically unattractive should be abandoned.

Moreover, the BLRA itself recognizes this principle in expressly allowing the recovery of costs incurred by the utility where a plant has been abandoned so long as the utility proves “the decision to abandon the construction of the reactor was prudent.”

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<sup>8</sup> Marsh, pp. 7-8 describes the cost increase as follows, “In addition, in the 2010 update proceeding, the Company identified and itemized approximately \$174 million in costs to specific cost categories for the project that it would have accounted for using owner’s contingency cost before the court decision.”

**Q. What are the broad principles of utility ratemaking that you believe still apply?**

A. As I explain in my testimony, the constant review of the prudence of projects is exactly what happens in a competitive marketplace. In a competitive market, when a firm finds that a project is no longer economic, it must abandon that project because it will not be able to recover the costs so it can pursue alternative investments with higher returns. Firms must make such decisions on a forward looking basis, regardless of sunk costs.

Emulating the competitive market, the utility should be constantly evaluating the economic prudence of its past investment decisions. The fact that economic analyses conducted between four and seven years ago concluded that the Summer 2 and 3 reactors were the least cost options does not mean they are the least cost options today. Because market fundamentals have shifted dramatically against the economics of nuclear power, Summer 2 and 3 are now far from the least cost alternative. The utility should conclude that the project should be halted and the future needs of SCE&G ratepayers should be met with lower cost alternatives.

**Q. How does the BLRA affect the analysis that must be done?**

A. Under the BLRA, costs that have been incurred must be recovered by the utility, but if the future costs are no longer prudent, the utility should say so, and the Commission should find as much. The Utility should be required to do the proper economic analysis in this and every proceeding in which it seeks to recover costs in excess of the original estimate.

Because the BLRA has guaranteed the recovery of previous costs incurred, in the analysis of the relative costs of future alternatives, the BLRA has the effect of requiring SCE&G and the Commission to compare the cost of completing the nuclear project to the costs of alternatives,



plus the costs that have been sunk into the nuclear reactor. This approach to project review (modified by the special treatment of sunk nuclear costs) rests on the fundamental economics of market behavior, which provides the basis for the broad principles of utility regulation. I believe it is consistent with the law in South Carolina as I read it. Legal counsel has indicated to me that he agrees with this view.

**Q. Do you believe that the construction of Summer 2 & 3 is the least cost approach to meeting the need for electricity in South Carolina?**

A. No, I conclude that Summer 2 & 3 will cost SCE&G ratepayers far more than readily available alternatives. I present preliminary estimates by adjusting the estimates from the original BLRA proceeding. Since the company analysis focused on natural gas as the primary alternative, I provide estimates of the cost of nuclear compared to gas in light of the dramatic decline in projected gas prices. The recent developments make the assumption of high gas prices that were central to the economic analysis in 2008 very doubtful at best. Under the current projections for gas prices, the gas option would be over four \$4 billion less costly than nuclear. Other factors could raise the consumer savings to \$8 billion more than the cost of natural gas over the 40 year life of the new reactors. I also show that independent analyses of the likely revenue requirement of nuclear and gas prepared in the past year support this conclusion.

Other factors, like falling demand and declining cost of alternatives, could lower the cost of meeting the need for electricity with alternatives even more. Simply put, Summer 2 & 3 are far from the least cost option and even with the sunk cost considered, it is very likely that SCE&G ratepayers would be better off if the reactors construction is halted.

**Q. Why do you qualify your conclusion by saying “it is very likely ratepayers will be much better off?”**

**A.** My evidence gives a strong indication of what the outcome of a thorough economic analysis would conclude because SCE&G has not done a detailed economic evaluation as it should and because many of the factors that will affect the final sunk costs are hidden behind a veil of confidential secrecy. The magnitude of the sunk costs and other obligations that SCE&G has incurred with the execution of the project to date are unclear, but there is a very good chance that they are substantially less than \$8 billion, which means that the ratepayers would be better off if the utility abandoned the project.

I base these statements on the comparison with gas, since that was the primary alternative the utility identified when it sought cost recovery for the project, but there could be even less costly options available today that a comprehensive economic analysis of all the options would reveal. Unfortunately, the utility has failed to present an economic analysis of the overall project. It should have done so in its Integrated Resource Plan; it did not. It could have done so as part of this proceeding; it did not. I recommend that the Commission order it do so as part of this proceeding and not make a decision on recovery of these cost overruns until it does so.

Time is of the essence. Because of the structure of the BLRA, the longer the utility delays in accepting the fact that the nuclear reactors are no longer the least cost option, the heavier the uneconomic burden that will be placed on ratepayers and the state economy. Under the BLRA, arguably the utility can charge ahead and complete the project in spite of the fact that it is not economic and there is nothing the commission can do to stop it from recovering the costs approved up to the original cost (with inflation adjustments). The only thing it can do to protect the ratepayers from harm, is require the utility to do the proper economic analysis and reject the

recovery of cost overruns, since increasing the cost of a project that is already not economic is the height of imprudence.

**Q. How is the remainder of your testimony organized?**

A. I begin with the broad view of regulation under the public utility act. In the next section I discuss why utility regulation is based on the principle that rates must be just, reasonable and prudent and how these principles are related to competitive market principles. I then show that dramatic changes in market conditions have undermined the economic attractiveness of nuclear reactor construction. Finally, I turn to the narrow view of cost recovery under the BLRA. I show that there are a variety of reasons the specific cost increases are imprudent and should not be recovered from ratepayers.

### **III. THE CONSUMER PROTECTION FUNDAMENTALS OF UTILITY REGULATION**

**Q. Why are utility rates regulated?**

A. Because electric utility service has long been viewed as a natural monopoly, it has been delivered to consumers in areas where utilities are given franchises as the monopoly service provider. The rates, terms and conditions of service are regulated, as are many of the investment decisions, since the delivery of service to consumers is not a competitive activity. Since there is no competition, consumers must be protected from the natural tendency of monopoly service providers to charge whatever the market will bear or provide poor service. Thus, public utility ratemaking is fundamentally consumer protection and it is constructed to give consumers the same protections that a competitive market would. In order to understand how advanced cost

recovery affects the process of consumer protection it is necessary to review several of the key principles of market competition and consumer protection that guide public utility commissions.

**Q. Why are the concepts of used and useful important to utility regulation?**

A. In traditional utility rate making, the utility makes all the investment in the plant necessary to bring it on line with shareholder resources. When the plant is ready to go on line, the utility seeks to put it into rate base. Only when the plant is ready to deliver electricity is it considered to be “used and useful” to the captive customers of the utility.

In a general rate case, the utility will seek to charge ratepayers for the sum it has invested in the plant, as well as recover the operating (variable) costs of generating power. The sum invested is also allowed to earn a return on capital during the construction phase, which is typically entered into a separate account (allowance for funds used during construction, AFUDC). The rates charged to consumers also include depreciation of the plant as it produces electricity, which returns the capital investment to the utility. Thus the utility gets a return of and on its capital while the plant is operating.

**Q. What role does the obligation that rates be just, reasonable and prudent play in utility regulation?**

A. The task of public utility commissions is generally to ensure that the utility delivers the least cost power, subject to the need for reliability (and other) considerations, since that would be the outcome in the marketplace. Competition drives the least cost, most efficient technology to the consumer. Emulating a competitive market, the public utility commission will consider whether the costs the utility seeks to recover from ratepayers are “just, reasonable and prudent.”

The commission oversees the decision about which technologies to use and which costs utilities are allowed to recover. Even where the construction of new facilities takes place within the parameters of an Integrated Resource Plan, which is a long term energy plan, the fact that the utility has been told or allowed to build a certain type of plant does not alter the fact that the costs cannot be recovered from ratepayers until the plant is used and useful and the cost (including the return on investment) are found to be just, reasonable and prudent.

These two principles of utility regulation protect consumers from different potential abuses. Used and useful ensures that ratepayers receive service in exchange for the recovery of costs, while just, reasonable and prudent ensure that the costs recovered are not excessive.

If projects are cancelled or abandoned they do not become used and useful and their costs would not normally be recovered in the marketplace. If all sellers suffer similar problems, market elasticities of supply and demand will determine the extent to which the costs will be recovered. Under some circumstances utilities may recover the costs associated with abandoned projects, if they can show that the decision to commence the project was prudent and the causes of the termination of the project were not imprudence on the part of the utility.

This pattern of cost recovery reflects what would happen in a competitive market, which is why it is used as a ratemaking standard. When a product is sold to the consumer, the consumer has the immediate use of the product and the price includes only a normal return on investment (if the market is competitive). Suppliers who are inefficient and have costs above the market price or who try to earn above-normal profits by setting prices above costs will not be able to recover those excess costs from consumers. Consumers would not purchase the overpriced products because they would have lower cost options in the market place. The supplier's inefficiency will come out of the supplier's pocket in the form of a lower rate of return

earned on the investment. These principles balance the interest of utility stockholders, who receive a fair rate of return for the risk they take, and ratepayers, who receive useful products at just and reasonable prices.

**Q. How does advanced cost recovery alter the process of ratepayer protection?**

A. Allowing utilities advanced cost recovery dramatically alters the aforementioned consumer protection process in a number of ways. The utility gets to charge ratepayers before the plant is used and useful. In the case of South Carolina, the recovery of approved costs is guaranteed, even if the reactor is not completed, subject to a prudence review. These changes alter the incentives of the utilities and shift the balance between stockholder and ratepayer interests.

- Advanced cost recovery with a guarantee of recovery shifts the risk of construction so dramatically that it provides a strong incentive for utilities to pursue the technologies that have been favored by the statute.
- By conferring a special advantage on nuclear, it distorts the utility and regulatory decision making process and gives utilities an incentive to choose investments that yield higher, guaranteed returns, even where the investments are not the lowest cost option.
- Shifting the risk of nuclear reactor construction onto the backs of ratepayer creates an ongoing problem because it diminishes the utility's incentive to drive a hard bargain with vendors or joint owners that recovers cost overruns from them, rather than ratepayers.
- Pre-approving and guaranteeing costs creates a large quantity of sunk costs. Utilities can "nickel and dime" the Commission to death with a series of "small" cost overruns, which the commission may feel pressured to approve, since so much has been sunk.

- Because the technologies that tend to be favored by advanced cost recovery are very large central station technologies, utilities favor them, since they increase the rate base and inflate shareholder income.
- Nuclear projects are so large that utility management tends to become totally focused on the single large project and to disregard or resist alternative projects.
- They may even have an incentive to oppose alternatives that might reduce the need for the large central station facilities.

**Q. Does this general view of advanced cost recovery fit the South Carolina Base Load Review Act?**

A. Yes, it does. On the one hand, the BLRA gave strong incentives for the utility to choose to build nuclear reactors to meet the future need for electricity. The statute gave a utility investing in a new nuclear reactor a remarkably good deal:

- advanced cost recovery,
- no challenge of individual cost elements as imprudent, guaranteed cost recovery as long as the utility adhered to the construction schedule and cost estimates,
- flexible scheduling contingencies,
- an automatic rate of inflation,
- the choice of advanced cost recovery or normal utility cost recovery,
- the full commission approved rate of return, even though substantial risk had been transferred to ratepayers through all of the above mechanisms; and
- allocation of recovery of costs of a base load facility according to peak load demand.

On the other hand, the BLRA did not alter or eliminate many of the features of utility regulation that are intended to protect consumers.

- The definitions of just, reasonable and prudent were not amended.
- The initial decision to build a reactor with advanced cost recovery is subject to the traditional principles that require the costs associated with the project to be just, reasonable and prudent, even though that decision was before the reactor became used and useful.
- Cost increases above the initial level approved to also be subject to full prudence review.
- If a project is abandoned, recovery of costs is subject to prudence review.
- The Integrated Resource Planning (IRP) process was not altered.

**Q. Are you asking the Commission to change its approach to the implementation of the just, reasonable and prudent principles?**

A. Not at all. The suspension of the used and useful standard for these specific investments introduces distortions into utility decision making that highlight the importance of the just, reasonable and prudent principles for ratemaking. I am only suggesting that the Commission rigorously apply the existing standards when it has the opportunity to do so. The BLRA review of cost overruns is an important opportunity.

Having opened the door to a prudence review under the BLRA by seeking to recover cost overruns from ratepayers, I believe the underlying statute also requires that the cost overrun be considered in the broader context of the overall project. I am not suggesting that the commission look back to disallow any costs that have already been deemed prudent by the initial ruling, but to ask whether further costs should be incurred. The statute allows all costs that have been approved to be recovered, but that does not stop the utility for deciding not to incur additional



costs, if the project is no longer the least cost alternative, nor does it preclude the Commission from examining the new, higher cost of the total project as part of its prudence review of the incremental cost overruns.

#### **IV. THE DRAMATIC CHANGE IN ELECTRICITY RESOURCE COSTS**

**Q. How have the market conditions changed?**

**A.** The economic fundamentals of the decision to build Summer 2 & 3 have changed so dramatically in just four years that it is imprudent for the utility to continue with the project. To demonstrate the impact of changing circumstances, I focus on the comparison between natural gas and nuclear because that is what the utility focused on in the initial BLRA filing. Showing that the conclusion reached by the utility and accepted by the commission is no longer valid presents the most direct challenge to the prudence of decision making on a going forward basis. I also note in my testimony that the change in circumstances creates the possibility to revisit alternatives like efficiency and renewables.

**Q. What has happened to natural gas prices?**

The collapse of gas prices has been dramatic, tied to a technological breakthrough in drilling, which has dramatically increased the availability of natural gas.

Exhibit MNC-2 sheds light on this dramatic shift. It reproduces the gas price projection from the 2008 proceeding and overlays the most recent projection from the Energy Information Administration.

Exhibit MNC-3 shows that the EIA projections are consistent with the current futures market. Today one can buy natural gas futures for 2020 delivery at a fraction of the level used in the 2008 analysis. The long run history of natural gas prices shows that the very high prices of the 2005-2008 period when the policy and analysis of nuclear reactors were being written in South Carolina were an aberration, the exception, rather than the rule.

The evidence in the 2008 proceeding calculated the increase in annual cost (calculated as levelized costs, which adjusts for inflation and the time value of money) if natural gas was 25% higher than the baseline, at \$53.4 million per year. The current EIA projection is 62% lower than the baseline. The levelized cost of the natural gas scenario at the current EIA projected costs would be about \$132 million less per year. Since the 2008 baseline natural gas scenario was \$15 million per year higher than nuclear, at current EIA projected prices the natural gas scenario would be over \$115 million per year lower.

**Q. Are there other factors that indicate the nuclear option is less attractive compared to gas than it may have seemed in 2008?**

A. Yes, there are several. The capital cost of adding natural gas capacity has probably declined relative to nuclear. While the underlying cost escalators for all utility plant construction has declined, the cost overruns for nuclear have taken back all of the reduction in the escalation that could have lowered consumer bills. Since capital costs account for a much smaller share of the total cost for gas plant, the effect is small, but not insignificant.

**Q. Did the assumption about a carbon tax play an important role in the 2008 economic analysis?**

A. Yes it did. As shown in Exhibit MNC-4, even with the erroneous assumption of exceptionally high natural gas prices in the base case, the baseline natural gas alternative was less costly than the nuclear alternative in many scenarios. It was the assumed carbon tax that tipped the scales in favor of nuclear over gas. The matrix I have reproduced in Exhibit MNC-4 was accompanied by the following risk evaluation: "The table below shows the sensitivity of the economic results to the price of a CO<sub>2</sub> credit.... The shaded area highlights the combination of CO<sub>2</sub> price and escalation which results in the gas strategy being more economical than the nuclear strategy." The company chose a base case for carbon of \$15 per ton escalating at 7% per year, which, it so happens, was just outside of the grey area in which gas was preferable to nuclear.

However, if we factor in the new gas prices and assume a small impact of lower capital costs for gas projects, we arrive at a very different picture of the decision space, as shown in Exhibit MNC-5. Nuclear looks like a very bad choice because it is dependent on a very high price and a very high escalation rate for CO<sub>2</sub> prices. A prudent person, looking at that matrix, is not going to conclude that nuclear is a preferred option.

As a baseline for economic analysis, I start from the simple economics, so that the commission can see the implications of its decision about how much weight to give to the price on carbon. Even with 2008 projected prices, the levelized cost of natural gas was \$87 million per year lower than nuclear. Combining that with the current gas price projections, the levelized cost advantage of natural gas would be over \$200 million per year. Over a 40 year period, the excessive costs of continuing with the project are over \$8 billion. Paying the sunk costs of the nuclear project would eat into this cushion of potential savings, but if the Commission and the utility move quickly to shut the project down, I believe that there would be substantial net

savings for the ratepayers of SCE&G. That is why the commission should require the full economic analysis as part of this proceeding.

**Q. Is this conclusion widely recognized in the industry.**

**A.** Yes it is. In fact, the EIA presented analysis of the levelized cost of generation in 2009, 2010 and 2012. As shown in Exhibit MNC-6, in every case, the projected levelized cost of natural gas was well below the projected levelized cost of new nuclear reactors.<sup>9</sup> EIA even projects the cost of advanced combined cycle gas plants with carbon capture and storage technology to be well below the cost of nuclear.

Under the load factor and reactor life assumptions used in the EIA analysis, which are quite close to those used in the BLRA review,<sup>10</sup> the cost advantage of advanced combined cycle gas plants compared to nuclear in the EIA analyses has been about twice as large as I have calculated by adjusting the company's original analysis. Differences in assumptions about the amount and cost of capital and subsidies and tax breaks, among other things, may account for the larger advantage of gas over nuclear in the EIA analysis. Thus, I believe the \$8 billion figure from my simple adjustment for natural gas and carbon prices is a cautious estimate of potential consumer savings.

The CEO of the utility with the largest fleet of existing reactors, John Rowe of Exelon, has made it clear that he does not see it as an economic option at this time.<sup>11</sup> As shown in Exhibit MNC-7, efficiency and natural gas are projected to be far less costly than nuclear and yield large increments of resources.

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<sup>9</sup> The California Energy Commission, *Generation Cost Model* has higher costs for both gas and nuclear in 2009, but a much larger cost advantage for natural gas, [http://energyalmanac.ca.gov/electricity/levelized\\_costs.html](http://energyalmanac.ca.gov/electricity/levelized_costs.html)

<sup>10</sup> EIA uses a 90% load factor, the BLRA analysis used a 92% load factor (Exhibit H, p. 3).

<sup>11</sup> [http://www.exeloncorp.com/assets/newsroom/speeches/docs/spch\\_Rowe\\_AEI2011.pdf](http://www.exeloncorp.com/assets/newsroom/speeches/docs/spch_Rowe_AEI2011.pdf).

**Q. Are you suggesting that the Commission ignore the carbon issue?**

A. Not at all. I am not against including it in the analysis or addressing it as public policy. The key is to take the least cost approach to meeting any policy challenge. Thus, I believe that the initial economic analysis should be straight forward with other policies layered on top, with a clear estimate of costs.

Rowe makes that point by stating the cost of low carbon alternatives in terms of the cost per ton of CO<sub>2</sub> saved, as shown in Exhibit MNC-8. In this view, gas still is more attractive than nuclear, but some of its advantage is eaten away by its carbon output. In this view, efficiency is the most attractive resource, with a significant contribution from applications that have a negative cost impact (i.e. it costs less to save a MW than the current average cost of producing it).

**Q. Are there other factors that shift the economic calculation against nuclear being the least cost option?**

A. A dramatic reduction in demand growth reinforces this conclusion because natural gas plants can be added in smaller increments and shorter time periods, resulting in a better fit between need and capacity. As shown in Exhibit MNC-9, the projected peak demand for 2020 is down by over 700 MW since the 2008 proceeding. That reduction in demand equals substantially more than half of the capacity the nuclear project will bring on line for SCE&G. This will result in a sharp increase in capacity above the reserve margin requirement, which increases the cost to ratepayers. Adding smaller increments farther out in the future reduces both the level of capital spending and the present value of the revenue requirement.

The fact that demand growth pressure on resources has been alleviated is important not only because it makes natural gas a more attractive option, it also makes other resources more attractive. The company reports positive results from its DSM experiments that should be examined. Mr. Marsh testifies that DSM has delivered the equivalent of 10MW at a cost of \$11 million, a cost of \$1100 (Marsh, p. 24, \$11million for 10 MW = \$1100/kw). The full cost of Summer 2 and 3 is over four times as high (Walker, Exhibit 1; \$5,761,910/1228MW = \$4692/kw).

The luxury of time afforded by the slowing of demand growth creates the opportunity for the utility to develop and expand the efficiency option to see how far it can go. Efficiency as a low cost resource has not been well developed by the utility. Comparative studies of the efficiency programs of states and utilities prepared by public interest groups and utility consultants all show that South Carolina and SCE&G are well below the national average in effort and results<sup>12</sup> and appear to be falling farther behind.<sup>13</sup>

The cost of other alternatives, like wind, solar photovoltaics, geothermal and hydro that can make a contribution to future needs has been falling and with time are projected to be cost competitive with central station facilities. Time is a critical factor here, too. The ability to gather more information and observe trends is a valuable option to improve decision making in an environment typified by a great deal of risk and uncertainty. Slowing demand growth enhances the opportunity to exercise this real option. Combined with the much shorter lead time needed to construct gas plants, the portfolio made up of gas and efficiency and renewables is much lower in cost and more flexible.

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<sup>12</sup> American Council for an Energy Efficient Economy, <http://aceee.org/sector/state-policy/scorecard>; Charles, J. Cicchetti, *Going Green and Getting Regulation Right* (Public Utilities Reports, 2009), chapters 5 and 6.

<sup>13</sup> <http://www.aceee.org/sites/default/files/publications/researchreports/c126.pdf>.

With demand growth slowing and the cost of alternative falling compared to nuclear, the utility should be considering the lower cost alternatives, but the commitment to the nuclear reactor forecloses serious consideration of these lower cost options. In effect, the commitment to nuclear crowds out the alternatives by commanding the utility's attention and resources and creating an overhang of excess capacity. My analysis shows crowding out is a systemic problem.<sup>14</sup>

**Q. What is the relationship between this proceeding and the Integrated Resource Planning (IRP) proceeding?**

**A.** The IRP proceeding in South Carolina is a critically important, ongoing planning process that was not altered or suspended by the enactment of the BLRA. Developing an IRP that balances various factors should provide important information for the Commission to determine whether nuclear construction is the least cost option. I believe that the "simple" economic conclusions I offer above are reinforced with a more complex IRP analysis. Efficiency and some renewables are lower in cost. Moreover, when risk and uncertainty are taken into account in a full portfolio analysis efficiency and renewables become even more attractive.

Exhibit MNC-10 presents the results of national level analysis I have developed that combines levelized cost analysis with a measure of risk (variable cost and capital cost uncertainty) to compare alternatives. The risk-adjusted expected cost can be measured as the distance from the origin in the graph. In this analysis, gas maintains its advantage over nuclear (in part because nuclear capital costs are unknown) but efficiency and several renewables

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<sup>14</sup> Mark Cooper, *Policy Challenges of Nuclear Reactor Construction: Cost Escalation and Crowding Out Alternatives*, Institute for Energy and the Environment, Vermont Law School, September, 2010, with some evidence of poor performance ([http://www1.eere.energy.gov/wip/solutioncenter/pdfs/tap\\_webinar\\_20090218\\_doris.pdf](http://www1.eere.energy.gov/wip/solutioncenter/pdfs/tap_webinar_20090218_doris.pdf)) and hostility (<http://www.thestate.com/2012/03/11/v-print/2186830/scuttled-solar-deal-leaves-churches.html>) in South Carolina

become more attractive when risk is factored in. The more carefully an IRP considers alternatives, the more attractive efficiency and renewables become.

**Q. Is risk analysis generally used in making resource decisions?**

**A.** Yes it is. As discussed above, the centerpiece of the company's 2008 economic analysis was just such an implicit risk assessment. The risk factor they chose to make central was the level and escalation rate of a price on carbon.

## **V. COST OVERRUNS UNDER THE BLRA**

**Q. How does the BLRA view cost overruns?**

**A.** In spite of all the remarkably favorable treatments of nuclear reactors under the BLRA, the utility has chosen to leave the safe harbor of the initial prudence review and seek recovery of a massive cost overrun. I believe that it is imprudent within the terms of the advanced cost recovery language of the statute. The statute did not intend to give the utility a blank check. Cost overruns must be just, reasonable and demonstrated to be prudent.

The utility originally sought approval of the project on the basis of a cost estimate and then revised it upward after the contingency cost pool was not allowed. Given the special treatment of costs under the BLRA, cost increases demand close scrutiny, to avoid a strategy in which the utility locks in sunk costs with low-ball estimates and puts pressure on regulators to approve a series of "small" cost overruns.

The fact that the company identifies a series of risks associated with the construction of nuclear reactors did not excuse it from properly evaluating and incorporating those risks into the



initial cost estimate. If they can shift the risks to ratepayers, they will be inclined to make more risky decisions than they would if they had skin in the game.

The fact that the company identifies a series of risks associated with the construction of nuclear reactors does not exempt it from bearing some of the costs of those risks. It earns a full rate of return on its capital, which is supposed to reward it for risk, and has been afforded a variety of other incentives to invest in nuclear.

**Q. What costs should have been factored into the original estimate?**

A. The excuses the utility gives for the cost overruns are characteristics of the nuclear construction process that are well known and have been recognized for decades. They were identified by analysts of the current building cycle early on. Prudent decision making would have taken these factors into account when the proposal was presented to the Commission. The risks that the utility identifies and now wants to pass on to the ratepayers were well known before they made the cost estimate on which the reactors were approved and before they signed the EPC contract.

- The fact that there would be difficulties in finding adequately qualified and trained personnel was widely recognized.
- The fact that the supply chain was stretched thin was widely recognized.
- The fact that there would be bumps in the road of regulatory approval was also certainly predictable. The failure to comply with NRC requirements is the responsibility of the utility, not the ratepayers or the NRC.

- Given the history of nuclear reactor construction in the U.S. and around the world, the fact that requirements would evolve over time should have been foreseen and included in the cost estimate.

**Q. What costs that should not be shifted to ratepayers?**

**A.** The fact that SCG&E hoped others would help to defray the cost of developing a completed design was poor judgment on its part. Its cost estimate should have reflected the possibility that it would need to complete the project on its own. Hoping that five utilities would share the costs of finishing the design work was a risk the utility chose to take. The fact that the vendor apparently scuttled that approach by refusing to allow companies who had not signed an EPC to continue to participate in the design work (by not allowing them to see confidential information), only compounds the imprudence. Here we have a gamble by the utility that went bad as a result of unilateral action by the vendor, perhaps in an attempt to close sales, but the ratepayers are asked to pick up the tab.

The utility has discovered that its information technology (IT) systems are outdated and need to be updated. Unit 1 requires the upgrade, which would be reviewed in a general rate case. Antiquated IT costs are shifted from Unit 1, where they would be subject to routine cost recovery, into the Base Load Review Act proceeding (Walker, p. 15)

**Q. Is the allocation of the burden of risk in the cost overruns just, reasonable and prudent?**

**A.** No it is not. The company has shouldered none of the risks. The company points out that it negotiated a reduction in the vendor's claim for additional costs. Compared to the costs that

the utility has asked ratepayers to cover, the utility has asked for ratepayers to pick up six-sevenths of the total cost overruns. The utility has shouldered none of the costs as Table 1 shows:

**Table 1: Allocation of cost Overruns**

	Change Orders	Owner Cost	Transmission	Total
Vendor	\$76	0	0	76
Ratepayers	\$156	276	21	453
Owner	\$0	0	0	0

**Sources and Notes:** Total of increases in Order No. 2009-104(A), Exhibit 1 and 2012 requests as outlined in (Testimony of Kevin B. Marsh, pp.8, 9,19)

As my discussion of the role of prudence review above makes clear, producers are likely to bear some or all of the risk of cost overruns in competitive markets. Given that the utility is guaranteed a full rate of return in advance, allowing it to avoid any share of the cost overruns insulates it from the risks that ratepayers and even the vendors are bearing.

**Q. On what do you base your claims that many of these risks were known and should have been factored into the original cost projections?**

**A.** I have done extensive analysis of both the long-term history of nuclear construction and the development of the recent nuclear construction proposals. My analysis indicates that every one of the causes of the cost overruns here should have been quite evident to a prudent utility at the outset. The utility charged ahead with a low ball estimate in spite of this clear evidence of risk, underestimating the costs, which it now seeks to recovery through a third bite at the apple.

Exhibit MNC-10 presents a comprehensive view of U.S. nuclear construction cost estimates and actual costs, which I began compiling in 2009 to evaluate the question of whether

nuclear cost escalations are predictable. Versions of this graph have been reprinted in a number of diverse places, with the version in Exhibit MNC-10 drawn from my article in the current issue of the *Bulletin of the Atomic Scientists*.<sup>15</sup> Not only was the tendency for cost escalation known from the first generation of nuclear reactor construction, the recent cost estimates had shown a similar tendency from the beginning of the so called “nuclear renaissance” to 2008 when the utility put forward its cost estimate here. By comparing cost escalation in France and the U.S., as shown in Exhibit MNC-11 and analyzing the fundamental problem that safety poses for nuclear power, I have shown that the cost escalation problem is endemic to the technology.

The fact that there would be particular challenges in restarting a nuclear construction sector in the U.S. was well known at the time the utility prepared its estimate. The Keystone Center’s study of nuclear power<sup>16</sup> pointed to “a recent nuclear industry conference that was covered in a February 2007 story in *Nucleonic Week* that ran under the headline “Supply chain Could Slow the Path to Construction” and a January 18, 2007 story that ran under the headline “Vendors Relative Risk Rising in New Nuclear Power Market,” in regard to labor shortages.

By rushing to be among the first in line, for a design that had not been approved or implemented in the U.S., the utility took on extraordinary risk, that it failed to include in its initial cost estimate. It now seeks to impose the costs of its imprudently rosy initial cost projection with approval of cost overruns. If more than \$450 million of cost overruns had been included in the initial cost estimate, the Commission might well have concluded that nuclear reactor construction was not just, reasonable and prudent, even with the assumptions about high gas and carbon costs.

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<sup>15</sup> Mark Cooper, “Nuclear Safety and Affordable Reactors: Can We Have Both?,” *Bulletin of the Atomic Scientists*, 68(2), 2012, p. 63.

<sup>16</sup> The Keystone Center, Nuclear Power Joint Fact-Finding, June 2007, p. 33.

Subsidizing the revival of the nuclear construction sector was not the intention of the BLRA. The project must be just, reasonable and prudent by the traditional standards and the utility was obligated to factor those risks into its initial cost projection.

**Q. Is the imprudence of nuclear construction recognized in the utility sector?**

**A.** Yes. Ironically, the three utilities that the vendor blocked from working on the completion of the design were excluded because they had decided not to sign an EPC and move ahead with construction. In fact, the vast majority of projects that were under consideration when SCE&G signed its EPC have been cancelled or are dormant. SCE&G's public sector partners have been reducing their take of power from the project at a rapid pace.<sup>17</sup> General Electric, one of the largest vendors of generation technologies with a broad portfolio of wind, gas and nuclear has concluded that nuclear is much less attractive than gas and wind.<sup>18</sup> The EIA, Exelon and PJM analyses reach a similar conclusion, as do a number of other regulatory bodies and Wall Street analysts.<sup>19</sup>

**Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

**A.** Yes.

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<sup>17</sup> <http://www.santeecoopergreen.com/portal/page/portal/santeecooper/aboutus/newsroom/santeecoopernewsreleases/25539444.pdf>; <http://www.businesswire.com/news/home/20120327006867/en/Fitch-Rates-South-Carolina-Public-Service-Auths>; <http://www.columbiabusinessreport.com/news/42877-duke-energy-moving-ahead-to-buy-stake-in-v-c-summer-nuclear-station>; <https://www.santeecooper.com/portal/page/portal/santeecooper/aboutus/newsroom/santeecoopernewsreleases/bd9094aabb8529bde044001a4b08f969>; [http://nuclearstreet.com/nuclear\\_power\\_industry\\_news/b/nuclear\\_power\\_news/archive/2012/04/25/santee-cooper-signs-letter-of-intent-with-american-municipal-for-v-c-summer-reactors-042502.aspx](http://nuclearstreet.com/nuclear_power_industry_news/b/nuclear_power_news/archive/2012/04/25/santee-cooper-signs-letter-of-intent-with-american-municipal-for-v-c-summer-reactors-042502.aspx);

<sup>18</sup> <http://www.ft.com/intl/cms/s/0/bd975d10-dd59-11e1-8fdc-00144feab49a.html#axzz22xSbueX4>.

<sup>19</sup> In addition to the California Energy Commission cited above in not 18, Mark Cooper, The Economics of Nuclear Reactors: Renaissance of Relapse, Institute for Energy and the Environment, Vermont Law School, June 2009, Chapter 5 discusses various estimates.

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University of Maryland, M.A., 1973, Sociology  
City College of New York, B.A., 1968, English

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President, Citizens Research, 1983 - present  
Research Director, Consumer Federation of America, 1983-present  
Associated Fellow, Columbia Institute on Tele-Information, 2003-present  
Fellow, Donald McGannon Communications Research Center, Fordham University, 2005-present  
Senior Fellow for Economic Analysis, Institute for Energy and the Environment, Vermont Law School, 2009-present  
Fellow, Stanford Center on Internet and Society, 2000-2010  
Fellow, Silicon Flatirons, University of Colorado, 2009-present  
Principle Investigator, Consumer Energy Council of America, Electricity Forum, 1985-1994  
Director of Energy, Consumer Federation of America, 1984-1986  
Director of Research, Consumer Energy Council of America, 1980-1983  
Consultant, Office of Policy Planning and Evaluation, Food and Nutrition Service, United States Department of Agriculture, 1981-1984  
Consultant, Advanced Technology, Inc., 1981  
Technical Manager, Economic Analysis and Social Experimentation Division, Applied Management Sciences, 1979  
Research Associate, American Research Center in Egypt, 1976-1977  
Research Fellow, American University in Cairo, 1976  
Staff Associate, Checchi and Company, Washington, D.C., 1974-1976  
Consultant, Division of Architectural Research, National Bureau of Standards, 1974  
Consultant, Voice of America, 1974  
Research Assistant, University of Maryland, 1972-1974

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Lecturer, Washington College of Law, American University, Spring, 1984 - 1986, Seminar in Public Utility Regulation  
Guest Lecturer, University of Maryland, 1981-82, Energy and the Consumer, American University, 1982, Energy Policy Analysis  
Assistant Professor, Northeastern University, Department of Sociology, 1978-1979, Sociology of Business and Industry, Political Economy of Underdevelopment, Introductory Sociology, Contemporary Sociological Theory; College of Business Administration, 1979, Business and Society  
Assistant Instructor, Yale University, Department of Sociology, 1977, Class, Status and Power  
Teaching Assistant, Yale University, Department of Sociology, 1975-1976, Methods of Sociological Research, The Individual and Society

Instructor, University of Maryland, Department of Sociology, 1974, Social Change and Modernization, Ethnic Minorities  
Instructor, U.S. Army Interrogator/Linguist Training School, Fort Hood, Texas, 1970-1971

### **PROFESSIONAL ACTIVITIES:**

Member, Advisory Committee on Appliance Efficiency Standards, U.S. Department of Energy, 1996 - 1998  
Member, Energy Conservation Advisory Panel, Office of Technology Assessment, 1990-1991  
Fellow, Council on Economic Regulation, 1989-1990  
Member, Increased Competition in the Electric Power Industry Advisory Panel, Office of Technology Assessment, 1989  
Participant, National Regulatory Conference, The Duty to Serve in a Changing Regulatory Environment, William and Mary, May 26, 1988  
Member, Subcommittee on Finance, Tennessee Valley Authority Advisory Panel of the Southern States Energy Board, 1986-1987  
Member, Electric Utility Generation Technology Advisory Panel, Office of Technology Assessment, 1984 - 1985  
Member, Natural Gas Availability Advisor Panel, Office of Technology Assessment, 1983-1984  
Participant, Workshop on Energy and the Consumer, University of Virginia, November 1983  
Participant, Workshop on Unconventional Natural Gas, Office of Technology Assessment, July 1983  
Participant, Seminar on Alaskan Oil Exports, Congressional Research Service, June 1983  
Member, Thermal Insulation Subcommittee, National Institute of Building Sciences, 1981-1982  
Round Table Discussion Leader, The Energy Situation: An Open Field For Sociological Analysis, 51st Annual Meeting of the Eastern Sociological Society, New York, March, 1981  
Member, Building Energy Performance Standards Project Committee, Implementation Regulations Subcommittee, National Institute of Building Sciences, 1980-1981  
Participant, Summer Study on Energy Efficient Buildings, American Council for an Energy Efficient Economy, August 1980  
Member, University Committee on International Student Policy, Northeastern University, 1978-1979  
Chairman, Session on Dissent and Societal Reaction, 45th Annual Meeting of the Eastern Sociological Society, April, 1975  
Member, Papers Committee, 45th Annual Meeting of the Eastern Sociological Society, 1975  
Student Representative, Programs, Curricula and Courses Committee, Division of Behavioral and Social Sciences, University of Maryland, 1973-1974  
President, Graduate Student Organization, Department of Sociology, University of Maryland, 1973-1974

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Ester Peterson Award for Consumer Service, 2010  
American Sociological Association, Travel Grant, Uppsala, Sweden, 1978  
Fulbright-Hayes Doctoral Research Abroad Fellowship, Egypt, 1976-1977  
Council on West European Studies Fellowship, University of Grenoble, France, 1975  
Yale University Fellowship, 1974-1978  
Alpha Kappa Delta, Sociological Honorary Society, 1973  
Phi Delta Kappa, International Honorary Society, 1973  
Graduate Student Paper Award, District of Columbia Sociological Society, 1973  
Science Fiction Short Story Award, University of Maryland, 1973  
Maxwell D. Taylor Award for Academic Excellence, Arabic, United States Defense Language Institute, 1971  
Theodore Goodman Memorial Award for Creative Writing, City College of New York, 1968  
New York State Regents Scholarship, 1963-1968  
National Merit Scholarship, Honorable Mention, 1963

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Fueling Profits: Industry Consolidation, Excess Profits, & Federal Neglect: Domestic Causes of Recent Gasoline and Natural Gas Price Shocks (Consumer Federation of America and Consumers Union, May 2004)

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- “Testimony of Dr. Mark N. Cooper on Behalf of the Arizona Consumers Council,” In the Matter of the Competition in the Provision of Electric Services Throughout the State of Arizona, The Arizona Corporation Commission, January 21, 1998
- “Direct Testimony of Dr. Mark N. Cooper on Behalf of the Virginia Citizens Consumers Council,” Virginia Electric Power Company, Application of Approval of Alternative Regulatory Plan, State Corporation Commission of Virginia, December 15, 1997
- “Electric Industry Restructuring: Who Wins? Who Loses? Who Cares?” Hearing on Electric Utility Deregulation, National Association of Attorneys General, November 18, 1997
- “Direct Testimony of Dr. Mark N. Cooper in Response to the Petition of Enron Energy Services Power, Inc., for Approval of an Electric Competition and Customer Choice Plan and for Authority Pursuant to Section 2801 (E)(3) of the Public Utility Code to Service as the Provider of Last Resort in the Service Territory of PECO Energy Company on Behalf of the American Association of Retired Persons,” Pennsylvania Public Utility Commission v. PECO, Docket No. R-00973953, November 7, 1997.
- “Policies to Promote Universal Service and Consumer Protection in the Transition to Competition in the Electric Utility Industry,” Regulatory Flexibility Committee, Indiana General Assembly, September 9, 1997
- “Reply Testimony of Dr. Mark N. Cooper on Behalf of the Attorney General of Arkansas,” In the Matter of Rulemaking Proceeding to Establish Rules and Procedures Necessary to Implement the Arkansas Universal Service Fund, Arkansas Public Service Commission, Docket No. 97-041-R, July 21, 1997
- “Statement of Dr. Mark N. Cooper,” In the Matter of the Rulemaking by the Oklahoma Corporation Commission to Amend and Establish Certain Rules Regarding the Oklahoma Universal Service Fund, Cause No. RM 970000022.
- “Direct Testimony of Dr. Mark N. Cooper on Behalf of the Alliance for South Carolina’s Children,” In Re: Intrastate Universal Service Fund, before the Public Service Commission of South Carolina, Docket NO. 97-239-C, July 21, 1997
- “Direct Testimony of Dr. Mark N. Cooper on Behalf of Kentucky Youth Advocate, Inc.,” In the Matter of Inquiry into Universal Service and Funding Issues, before the Public Service Commission Commonwealth of Kentucky, Administrative Case NO. 360, July 11, 1997
- “Direct Testimony of Dr. Mark N. Cooper on Behalf of the Office of Public Utility Counsel, Application of Southwestern Bell Telephone Company for Non-Rate Affecting Changes in General Exchange Tariff, Section 23, Pursuant to PURA95 s.3.53 (D), before the Public Utility Commission of Texas, July 10, 1997
- “Testimony of Dr. Mark N. Cooper on Behalf of the American Association of Retired Persons,” Application of Pennsylvania Power and Light Company for Approval of its Restructuring Plan Under Section 2806 of the Public Utility Code, Pennsylvania Public Utility Commission, Docket No. R-00973954, July 2, 1997

- "Testimony of Dr. Mark N. Cooper on Behalf of the American Association of Retired Persons," Application of PECO Company for Approval of its Restructuring Plan Under Section 2806 of the Public Utility Code, Pennsylvania Public Utility Commission, June 20, 1997
- "Initial Testimony of Dr. Mark N. Cooper on Behalf of the Attorney General of Arkansas," In the Matter of Rulemaking Proceeding to Establish Rules and Procedures Necessary to Implement the Arkansas Universal Service Fund, Arkansas Public Service Commission, Docket No. 97-041-R, June 16, 1997
- "A New Paradigm for Consumer Protection," National Association of Attorney's General, 1997 Spring Consumer Protection Seminar, April 18, 1997.
- "Statement of Dr Mark N. Cooper," Project on Industry Restructuring, Public Utility Commission of Texas, Project No. 15000, May 28, 1996
- "Direct Testimony of Dr. Mark N. Cooper Submitted on behalf of The American Association of Retired Persons, before the Public Service Commission, State of New York, In the Matter of Competitive Opportunities Case 94-E-0952 New York State Electric and Gas Co. 96-E-0891; Rochester Gas and Electric Corp. 96-E-0898 Consolidated Edison Company of New York, Inc. 96-E-0897
- "Direct Testimony of Dr. Mark N. Cooper on Behalf of Office of Consumer Advocate," before the Pennsylvania Public Utility Commission, Pennsylvania Public Utility Commission Bureau of Consumer Services v. Operator Communications, Inc. D/b/a Oncor Communications, Docket No. C-00946417, May 2, 1997
- "Direct Testimony of Dr. Mark N. Cooper, on Behalf of New York Citizens Utility Board, the Consumer Federation of America, the American Association of Retired Persons, Consumers Union, Mr. Mark Green, Ms. Catherine Abate, the Long Island Consumer Energy Project," before the Public Service Commission, State of New York, Proceeding on Motion of the Commission as the Rates, Charges, Rules and Regulations of New York Telephone Company, NYNEX Corporation and Bell Atlantic Corporation for a Declaratory Ruling that the Commission Lacks Jurisdiction to Investigate and Approve a Proposed Merger Between NYNEX and a Subsidiary of Bell Atlantic, or, in the Alternative, for Approval of the Merger, Case 96-c-603, November 25, 1996
- "Consumer Protection Under Price Cap Regulation: A Comparison of U.S. Practices and Canadian Company Proposals," before the CRTC, Price Cap Regulation and Related Matters, Telecom Public Notice CRTC, 96-8, on behalf of Federation Nationale des Associations de Consommateurs du Quebec and the National Anti-Poverty Organization, August 19, 1996
- "Responses of Dr. Mark N. Cooper on Behalf of the Attorney General of Oklahoma," In the Matter of the Rulemaking by the Oklahoma Corporation Commission to Establish Rules and Regulations Concerning Universal Service, Cause NO. RM 96000015, May 29, 1996
- "Statement of Dr. Mark N. Cooper on Behalf of the Attorney General of Oklahoma," In the Matter of the Oklahoma Corporation Commission to Establish Rules and Regulations Concerning Pay Telephones, Cause NO. RM 96000013, May 1996
- "Statement of Dr. Mark N. Cooper on Behalf of the Attorney General of Oklahoma," In the Matter of An Inquiry by the Oklahoma Corporation Commission into Alternative Forms of Regulation Concerning Telecommunications Service, Cause NO. RM 950000404
- "Statement of Dr. Mark N. Cooper to the System Benefits Workshop," Project on Industry Restructuring, Project No. 15000, before the Public Utility Commission of Texas, May 28, 1996
- "Remarks of Dr. Mark N. Cooper, Panel on Service Quality from the Consumer Perspective," NARUC Winter Meetings, Washington, D.C., February 26, 1996
- "Attorney General's Comments," Before the Arkansas Public Service Commission, In the Matter of the Non-Traffic Sensitive Elements of Intrastate Access Charges and Carrier Common Line and Universal Service Fund Tariffs of the Local Exchange Companies, Docket NO. 86-159-U, November 14, 1995
- "Reply Comments and Proposed Rules of the Oklahoma Attorney General," Before the Corporation Commission of the State of Oklahoma, In the Matter of the Rulemaking of the Oklahoma Corporation Commission to Establish Rules and Regulations for Local Competition in the Telecommunications Market, Cause No. RM 950000019, October 25, 1995
- "Remarks of Dr. Mark N. Cooper on Behalf of the American Association of Retired Persons to the Members of the Executive Committee," Indiana Utility Regulatory Commission, in the Matter of the Investigation on the Commission's Own Motion into Any and All Matters Relating to Local Telephone Exchange Competition Within the State of Indiana, Cause No. 39983, September 28, 1995

- "Direct Testimony of Dr. Mark N. Cooper on Behalf of the Office of Public Utility Counsel," before the Public Utility Commission of Texas, Petition of MCI Telecommunications Corporation for an Investigation of the Practices of Southwestern Bell Telephone Company Regarding the 713 Numbering Plan Area and Request for a Cease and Desist Order Against Southwestern Bell Telephone Company, SOAH Docket No. 473-95-1003, September 22, 1995
- "Rebuttal Testimony of Dr. Mark N. Cooper on Behalf of the Office of the Attorney General State of Arkansas," Before the Arkansas Public Service Commission, In the Matter of an Earnings Review of GTE Arkansas Incorporated, Docket NO. 94-301-U, August 29, 1995
- "Direct Testimony of Dr. Mark N. Cooper on Behalf of the Office of Public Utility Counsel," before the Public Utility Commission of Texas, Petition of MCI Telecommunications Corporation for an Investigation of the Practices of Southwestern Bell Telephone Company Regarding the 214 Numbering Plan Area and Request for a Cease and Desist Order Against Southwestern Bell Telephone Company, Docket NO. 14447, August 28, 1995
- "Direct Testimony of Mark N. Cooper On Behalf of the Office of the People's Counsel of the District of Columbia," Before the Public Service Commission of the District of Columbia, In the Matter of Investigation Into the Impact of the AT&T Divestiture and Decisions of the Federal Communications Commission on the Chesapeake and Potomac Telephone Company's Jurisdictional Rates, July 14, 1995
- "Comments of Consumer Action and the Consumer Federation of America," Before the Public Utilities Commission of California, Order Instituting Rulemaking on the Commission's Own Motion into competition for Local Exchange Service, Docket Nos. R. 95-04-043 and I. 95-04-044, May 23, 1995
- "Testimony of Dr. Mark N. Cooper on Behalf of the Arkansas Attorney General," before the Arkansas Public Service Commission, In the Matter of an Earnings Review of Southwestern Bell Telephone Company, Docket NO. 92-260-U, April 21, 1995
- "Promoting Competition and Ensuring Consumer Protection on the Information Superhighway, Testimony of Dr. Mark N. Cooper on Behalf of the American Association of Retired Persons and the Consumer Federation of America on Proposed Revisions of Chapter 364," Committee on Commerce and Economic Opportunities, Florida Senate, April 4, 1995
- "Direct Testimony and Exhibits of Dr. Mark N. cooper on Behalf of the Division of consumer Advocacy," In the Matter of Public Utilities Commission Instituting a Proceeding on Communications, Including an Investigation of the Communications Infrastructure in Hawaii, docket No. 7701, March 24, 1995
- "Promoting Competition and Ensuring Consumer Protection on the Information Superhighway, Testimony of Dr. Mark N. Cooper on Behalf of the American Association of Retired Persons and the Consumer Federation of America on Proposed Revisions of Chapter 364," Florida House of Representative, March 22, 1995
- "Prepared Testimony of Dr. Mark N. Cooper on Behalf of the Office of the Attorney General State of Arkansas," Before the Arkansas Public Service Commission, In the Matter of an Earnings Review of GTE Arkansas Incorporated, Docket NO. 94-301-U, March 17, 1995
- "Statement of Dr. Mark N. Cooper," DPUC Investigation into The Southern New England Cost of Providing Service, Docket No. 94-10-01, January 31, 1995
- "Statement of Dr. Mark N. Cooper," DPUC Exploration of Universal Service Policy Options, Docket No. 94-07-08, November 30, 1994
- "Statement of Dr. Mark N. Cooper," DPUC Investigation of Local Service Options, including Basic Telecommunications Service Policy Issues and the Definition of Basic Telecommunications Service, Docket No. 94-07-07, November 15, 1994
- "Testimony of Dr. Mark N. Cooper on Behalf of Attorney General of the Commonwealth of Kentucky, Utility and Rate Intervention Division, before the Public Service Commission, Commonwealth of Kentucky, Case No. 94-121, August 29, 1994
- "Testimony of Dr. Mark N. Cooper on Behalf of the American Association of Retired Persons," before the Public Utilities Commission of Ohio, In the Matter of the Application of the Ohio Bell Telephone Company for Approval of an Alternative Form of Regulation and In the Matter of the Complaint of the Office of Consumers' Counsel, v. Ohio Bell Telephone Company, Relative to the Alleged Unjust and Unreasonable Rates and Charges, Case Nos. 93-487-TP-ALT, 93-576-TP-CSS, May 5, 1994
- "Reply Testimony of Dr. Mark N. Cooper on Behalf of the Attorney General of Arkansas," before the Arkansas Public Service Commission, in the Matter of the Consideration of Expanded Calling Scopes and the Appropriate NTS

- Allocation and Return on Investments for the Arkansas Carrier Common Line Pool, Docket No. 93125-U, May 4, 1994
- "Direct Testimony of Dr. Mark N. Cooper on Behalf of the Attorney General of Arkansas," before the Arkansas Public Service Commission, in the Matter of the Consideration of Expanded Calling Scopes and the Appropriate NTS Allocation and Return on Investments for the Arkansas Carrier Common Line Pool, Docket No. 93125-U, April 22, 1994
- "Comments of Dr. Mark N. Cooper on Behalf of Consumers Union, Southwest Regional Office, before the Public Utility Commission of Texas, Request for Comments on the Method by which Local Exchange Services are Priced, Project No. 12771, April 18, 1994
- "Comments of Dr. Mark N. Cooper on Behalf of the American Association of Retired Persons," Before the Tennessee Public Service Commission, Inquiry for Telecommunications Rule making Regarding Competition in the Local Exchange, Docket No. 94-00184, March 15, 1994
- "Rebuttal Testimony of Dr. Mark N. Cooper on Behalf of the Virginia Citizens Consumer Council, Inc., before the State Corporation Commission at Richmond, Commonwealth of Virginia, In the Matter of Evaluating Investigating the Telephone Regulatory Case No. PUC930036 Methods Pursuant to Virginia Code S 56-235.5, March 15, 1994
- "Testimony of Dr. Mark N. Cooper on Behalf of the Virginia Citizens Consumer Council, Inc., before the State Corporation Commission at Richmond, Commonwealth of Virginia, In the Matter of Evaluating Investigating the Telephone Regulatory Case No. PUC930036 Methods Pursuant to Virginia Code S 56-235.5, February 8, 1994
- "Testimony of Dr. Mark N. Cooper on Behalf of The American Association of Retired Persons, Citizen Action Coalition, Indiana Retired Teachers Association, and United Senior Action, before the Indiana Utility Regulatory Commission, Cause No. 39705, December 17, 1993
- "Testimony of Dr. Mark N. Cooper on Behalf of the Virginia Citizens Consumer Council, Inc.," before the State Corporation Commission at Richmond, Commonwealth of Virginia, In the Matter of Evaluating the Experimental Plan for Alternative Regulation of Virginia Telephone Companies, Case No. PUC920029, October 22, 1993
- "Testimony of Dr. Mark N. Cooper on Behalf of the Attorney General," before the Arkansas Public Service Commission, In the Matter of An Earnings Review of Southwestern Bell Telephone Company, Docket No. 92-260-U, 93-114-C, August 5, 1993
- "Rebuttal Testimony of Dr. Mark N. Cooper on Behalf of the Attorney General," before the Public Service Commission of the State of Missouri, The Staff of the Missouri Public Service Commission vs. Southwestern Bell Telephone and Telegraph Company, Case No. TO-93-192, April 30, 1993
- "Direct Testimony of Dr. Mark N. Cooper on Behalf of the Office of Consumer Counsel," before the Public Utilities Commission of the State of Colorado, In the Matter of the Investigatory Docket Concerning Integrated Service Digital Network, Docket No. 92I-592T
- "Direct Testimony of Dr. Mark N. Cooper on Behalf of the People's Counsel," before the Florida Public Service Commission, Comprehensive Review of the Revenue Requirement and Rate Stabilization Plan of Southern Bell Telephone and Telegraph Company, Docket No. 900960-TL, November 16, 1992
- "Direct Testimony of Dr. Mark N. Cooper on Behalf of the American Association of Retired Persons," before the Florida Public Service Commission, Comprehensive Review of the Revenue Requirement and Rate Stabilization Plan of Southern Bell Telephone and Telegraph Company, Docket No. 900960-TL, November 16, 1992
- "Testimony of Dr. Mark N. Cooper" before the Regulatory Flexibility Committee, General Assembly, State of Indiana, August 17, 1992
- "Testimony of Dr. Mark N. Cooper On Behalf of the Consumer Advocate," before the Public Service Commission of South Carolina, Petition of the Consumer Advocate for the State of South Carolina to Modify Southern Bell's Call Trace Offering, Docket No. 92-018-C, August 5, 1992
- "Telecommunications Infrastructure Hoax," before the Public Service Commission of Colorado, Conference on ISDN for the Rest of Us, April 23, 1992
- "Testimony of Dr. Mark N. Cooper on Behalf of the Consumer Federation of America," before the Corporation Commission of the State of Oklahoma, In the Matter of the Corporation Commission's Notice of Inquiry Regarding Telecommunications Standards in Oklahoma, Cause No. PUD 1185, February 28, 1992

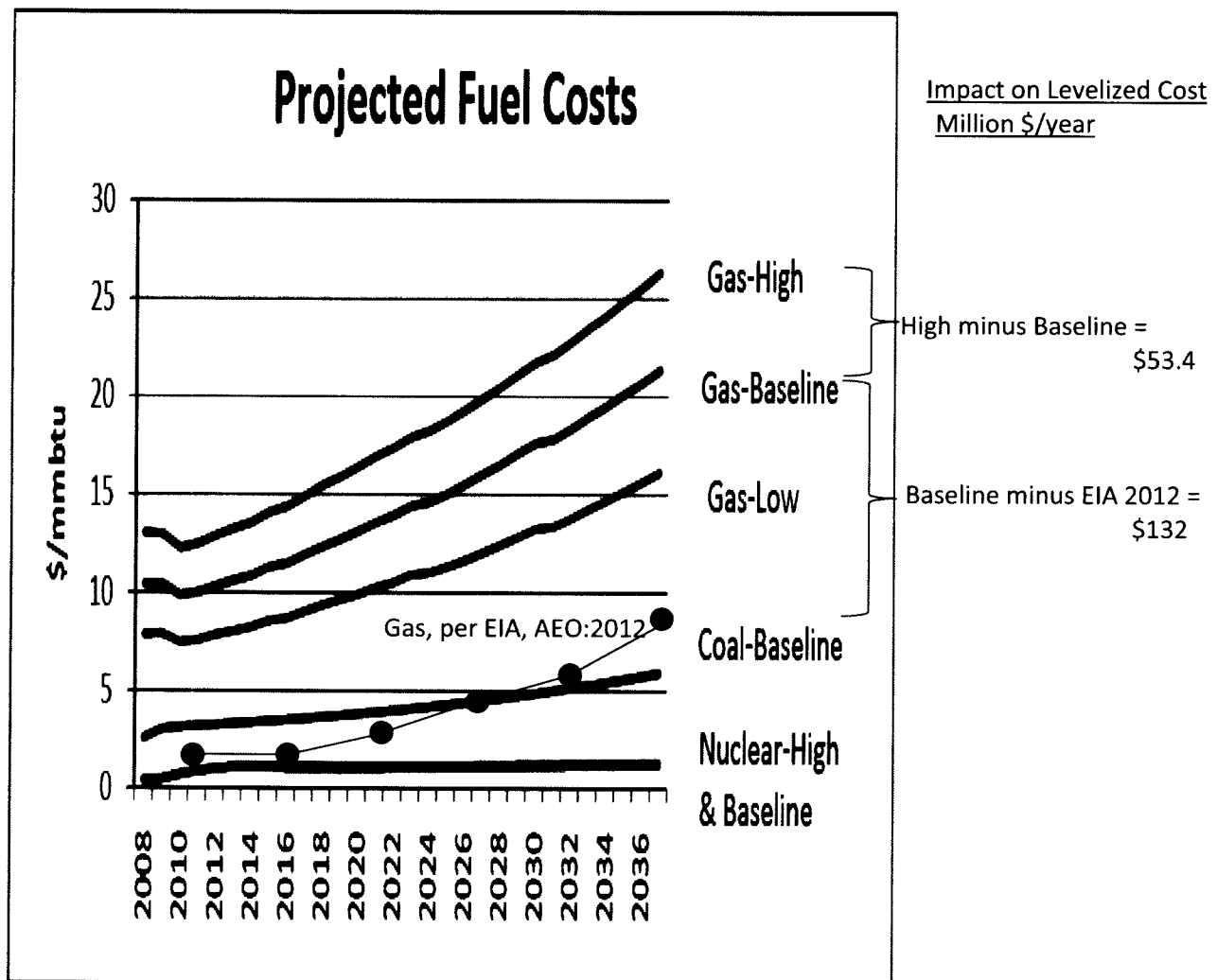
- "Testimony of Dr. Mark N. Cooper on Behalf of the Consumer Federation of America," before the Georgia Public Service Commission, in the Matter of A Southern Bell Telephone and Telegraph Company Cross-subsidy, Docket No. 3987-U, February 12, 1992
- "Testimony of Dr. Mark N. Cooper on Behalf of the Consumer Federation of America," before the Arkansas Public Service Commission, in the Matter of an Inquiry into Alternative Rate of Return Regulation for Local Exchange Companies, Docket No. 91-204-U, February 10, 1992
- "Statement on Behalf of the Consumer Federation of America on HB 1076," before the Missouri General Assembly, January 29, 1992
- "Testimony on behalf of the American Association of Retired Persons and the Consumer Federation of America," before the Legislative P.C. 391 Study Committee of the Public Service Commission of Tennessee, January 13, 1992
- "Direct Testimony on Behalf of the "Consumer Advocate," Public Service Commission State of South Carolina, In the Matter of the Application of Southern Bell Telephone and Telegraph Company for Approval of Revision to its General Subscribers Service Tariff (Caller ID), Docket No. 89-638-C, December 23, 1991
- "Comments of the Consumer Federation of America on Proposed Telecommunications Regulation in New Jersey (S36-17/A-5063)," New Jersey State Senate, December 10, 1991
- "Comments of the Consumer Federation of America," Before the Public Service Commission, State of Maryland, In the Matter of a Generic Inquiry by the Commission Into the Plans of the Chesapeake and Potomac Telephone Company of Maryland to Modernize the Telecommunications Infrastructure, Case No. 8388, November 7, 1991
- "On Behalf of the Office of Consumers Counsel," before the Public Utilities Commission of Ohio, In the Matter of the Application of the Ohio Bell Telephone Company to Revise its Exchange and Network Services Tariff, P.U.C.O. No. 1, to Establish Regulations, Rates, and Charges for Advanced Customer Calling Services in Section 8. The New Feature Associated with the New Service is Caller ID, Case No. 90-467-TP-ATA; In the Matter of the Application of the Ohio Bell Telephone Company to Revise its Exchange and Network Service Tariff, P.U.C.O. No 1, to Establish Regulations, Rates and Charges for Advanced Customer Calling Services in Section 8., The New Feature Associated with the New Service is Automatic Callback, Case No. 90-471-TP-ATA, September 3, 1991
- "On Behalf of the American Association of Retired Persons," Before the Senate Select Telecommunications Infrastructure and Technology Committee, 119th Ohio General Assembly, July 3, 1991
- "On Behalf of the Cook County State's Attorney," before the Illinois Commerce Commission, In Re: Proposed Establishment of a Custom Calling Service Referred to as Caller ID and Related Custom Service, Docket Nos. 90-0465 and 90-0466, March 29, 1991
- "On Behalf of the Vermont Public Interest Research Group," before the Public Service Board In Re: Investigation of New England Telephone and Telegraph Company's Phonesmart Call Management Services, Docket No. 54-04, December 13, 1990
- "On Behalf of the Office of Consumer Advocate," before the State of Iowa, Department of Commerce, Utilities Division, In Re: Caller ID and Related Custom Service, Docket No. INU-90-2, December 3, 1990
- "On Behalf of the Office of Public Counsel," before the Florida Public Service Commission, In Re: Proposed Tariff Filings by Southern Bell Telephone and Telegraph Company When a Nonpublished Number Can be Disclosed and Introducing Caller ID to Touchstar Service, Docket No. 891194-TI, September 26, 1990
- "On Behalf of the Office of Public Advocate," before the Public Service Commission, State of Delaware, In the Matter of: The Application of the Diamond State Telephone Company for Approval of Rules and Rates for a New Service Known as Caller\*ID, PSC Docket No. 90-6T, September 17, 1990
- "On Behalf of the Maryland People's Counsel," before The Public Service Commission of Maryland, In the Matter of Provision of Caller Identification Service by the Chesapeake and Potomac Company of Maryland, Case No. 8283, August 31, 1990
- "On Behalf of the Office of Attorney General," before the Commonwealth of Kentucky, Public Service Commission, In the Matter of the Tariff Filing of GTE South Incorporated to Establish Custom Local Area Signaling Service, Case No. 90-096, August 14, 1990
- "On Behalf of the Consumers' Utility Counsel," before the Georgia Public Service Commission Re: Southern Bell Telephone Company's Proposed Tariff Revisions for Authority to Introduce Caller ID, Docket No. 3924-U, May 7, 1990

- "Testimony of Dr. Mark N. Cooper on Caller Identification" before the Committee on Constitutional and Administrative Law, House of Delegates, Annapolis, Maryland, February 22, 1990
- "On Behalf of the Office of People's Counsel of the District of Columbia," before the Public Service Commission of the District of Columbia in the Matter of the Application of the Chesapeake and Potomac Telephone Company to Offer Return Call and Caller ID within the District of Columbia, Case No. 891, February 9, 1990
- "On Behalf of the Office of Consumer Advocate" before the Pennsylvania Public Utility Commission in the Matter of Pennsylvania Public Utility Commission v. The Bell Telephone Company of Pennsylvania, Docket NO. R-891200, May 1989.
- "Statement of Dr. Mark N. Cooper, Joint Hearing on the Public Utility Holding Company Act of 1935," Committees on Finance and Technology and Electricity, National Association of Regulatory Utility Commissioners, February 28, 1989
- "On Behalf of Manitoba Anti-poverty Organization, the Manitoba Society of Seniors and the Consumers Association of Canada (Manitoba)" before the Public Utilities Board in the Matter of the Request of Manitoba Telephone System for a General Rate Review, February 16, 1989
- "On Behalf of the Ohio Consumers Counsel, In the Matter of the Application of GTE MTO Inc. for Authority to Increase and Adjust its Rates and Charges and to Change Regulations and Practices Affecting the Same, Case No. 87-1307-TP- Air," before the Public Utility Commission of Ohio, May 8, 1988
- "On Behalf of the Evelyn Soloman, Proceeding on Motion of the Commission as to the Rates, Charges and Regulations of Niagara Mohawk Power Corporation, Case Nos. 29670 and 29671," before the State of New York Public Service Commission, February 16, 1988
- "An Economic Perspective - The Status of Competition in the Telecommunications Industry and Its Impact on Taxation Policy," Before the Joint Subcommittee on the Taxation of The Telecommunications Industry, December 8, 1987
- "On Behalf of the Office of Consumer Counsel, State of Washington," In the Matter of the Petition of AT&T Communications of Pacific Northwest, Inc. for Classification as a Competitive Telecommunications Company, March 24, 1987
- "On Behalf of Manitoba Anti-poverty Organization and the Manitoba Society of Seniors," before the Public Utilities Board in the Matter of the Request of Manitoba Telephone System for a General Rate Review, March 16, 1987
- "On Behalf of the Office of Consumers' Counsel, State of Ohio," In the Matter of the Application of the Ohio Bell Telephone Company for Authority to Amend Certain of its Intrastate Tariffs to Increase and Adjust the Rates and Charges and to Change its Regulations and Practices Affecting the Same, Case No. 84-1435-TP-AIR, April 6, 1986
- "On Behalf of Manitoba Anti-poverty Organization and Manitoba Society of Seniors," before the Public Utilities Board in the Matter of the Request of Manitoba Telephone System for a General Rate Review, February 6, 1986
- "On Behalf of Mississippi Legal Services Coalition, in the Matter of Notice by Mississippi Power and Light of Intent to Change Rates" Before the Mississippi Public Service Commission, April 15, 1985
- "On Behalf of the Universal Service Alliance, in the Matter of the Application of New York Telephone Company for Changes in it Rates, Rules, and Regulations for Telephone Service, State of New York Public Service Commission, Case No. 28961, April 1, 1985
- "On Behalf of North Carolina Legal Services, in the Matter of Application of Continental Telephone Company of North Carolina for an Adjustment of its Rates and Charges, Before the North Carolina Utilities Commission, Docket No. P-128, Sub 7, February 20, 1985
- "On Behalf of the Consumer Advocate in re: Application of Southern Bell Telephone and Telegraph Company for Approval Increases in Certain of Its Intrastate Rates and Charges," Before the South Carolina Public Service Commission, Docket No. 84-308-c, October 25, 1984
- "On Behalf of the Office of the Consumers' Counsel in the Matter of the Commission Investigation into the Implementation of Lifeline Telephone Service by Local Exchange Companies," Before the Public Utilities Commission of Ohio, Case No. 84-734-TP-COI, September 10, 1984
- "On Behalf of North Carolina Legal Services Resource Center in the Matter of Application Southern Bell Telephone and Telegraph Company for an Adjustment in its Rates and Charges Applicable to Intra-state Telephone Service in North Carolina," Before the North Carolina Utilities Commission, Docket No. P-55, Sub 834, September 4, 1984



- "On Behalf of Mississippi Legal Services Coalition in the Matter of the Citation to Show Cause Why the Mississippi Power and Light Company and Middle South Energy Should not Adhere to the Representation Relied Upon by the Mississippi Public Service Commission in Determining the Need and Economic Justification for Additional Generating Capacity in the Form of A Rehearing on Certification of the Grand Gulf Nuclear Project," Before the Mississippi Public Service Commission, Docket No. U-4387, August 13, 1984
- "On Behalf of the Mississippi Legal Services Corporation Re: Notice of Intent to Change Rates of South Central Bell Telephone Company for Its Intrastate Telephone Service in Mississippi Effective January 1, 1984," before the Mississippi Public Service Commission, Docket No. U-4415, January 24, 1984
- "The Impact of Rising Energy Prices on the Low Income Population of the Nation, the South, and the Gulf Coast Region," before the Mississippi Public Service Commission, Docket No. U4224, November 1982
- "In the Matter of the Joint Investigation of the Public Service Commission and the Maryland Energy Office of the Implementation by Public Utility Companies Serving Maryland Residents of the Residential Conservation Service Plan," before the Public Service Commission of the State of Maryland, October 12, 1982
- "The Impact of Rising Utility Rates on the Budgets of Low Income Households in the Region of the United States Served by the Mississippi Power Company and South Central Bell Telephone Company," before the Chancery Court of Forrest County, Mississippi, October 6, 1982
- "The Impact of Rising Energy Prices on the Low Income Population of the Nation, the South and the Gulf Coast Region," before the Mississippi Public Service Commission, Docket No. U-4190, August 1982

## 2008 NATURAL GAS COST ASSUMPTIONS COMPARED TO CURRENT, EIA COST PROJECTIONS

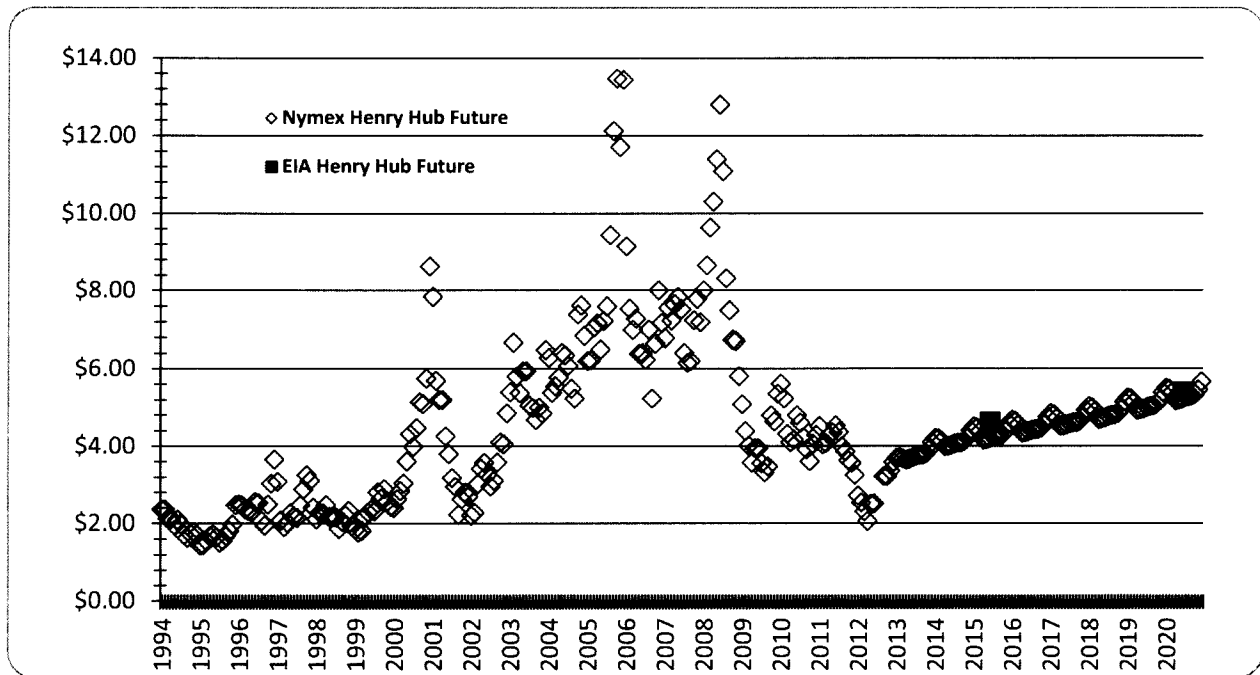
**Notes:**

**Baseline 2008:** Average gas price is \$16.40; 25% higher - \$4.10, \$4.10 = \$53.4 million/year levelized.

Levelized cost decrease per \$1/mmbtu difference =  $(\$53.4 / \$4.10) = 13.0244$

**EIA 2012:** Average gas price is \$6.27; \$10.13 lower, Levelized cost reduction =  $(\$10.13 * 13.024) = \$131.9$

**Sources:** Source: Exhibit H (Lynch, 2008, Exhibit JML-2), pp. 9-10; Energy Information Administration, Annual Energy Outlook, 2012, Table A1-p. 132.

**2008 EIA NATURAL GAS COST ASSUMPTIONS COMPARED TO NYMEX FUTURES**

Source: Exhibit H (Exhibit JML-2), pp. 9-10; Energy Information Administration, Natural Gas Spot and Future Prices, Contract 1; Prices, Annual Energy Outlook, 2012, Table A1-p. 132. CME, NyMex, Natural Gas Henry Hub, visited 8-1-2012.

The 2008 Net Cost Comparison of the Nuclear and Gas Options

Change in Levelized Rev. Req.: Gas Strategy Minus Nuclear Strategy Positive Entries Represent Nuclear Advantage in Millions of Dollars											
CO <sub>2</sub> Price / Escalation	\$0	\$5	\$10	\$15	\$20	\$25	\$30	\$35	\$40	\$45	\$50
0%	-87	-75	-63	-51	-40	-28	-16	-5	7	19	31
2%	-87	-71	-55	-39	-23	-7	9	25	41	57	73
4%	-87	-64	-42	-20	2	24	47	69	91	113	135
5%	-87	-60	-34	-7	19	45	72	98	124	151	177
6%	-87	-55	-24	8	39	71	102	134	165	197	228
8%	-87	-41	5	50	96	141	187	233	278	324	369
10%	-87	-19	48	116	183	250	318	385	453	520	587

Source: Exhibit H (Lynch, 2008, Exhibit JML-2), p. 11.

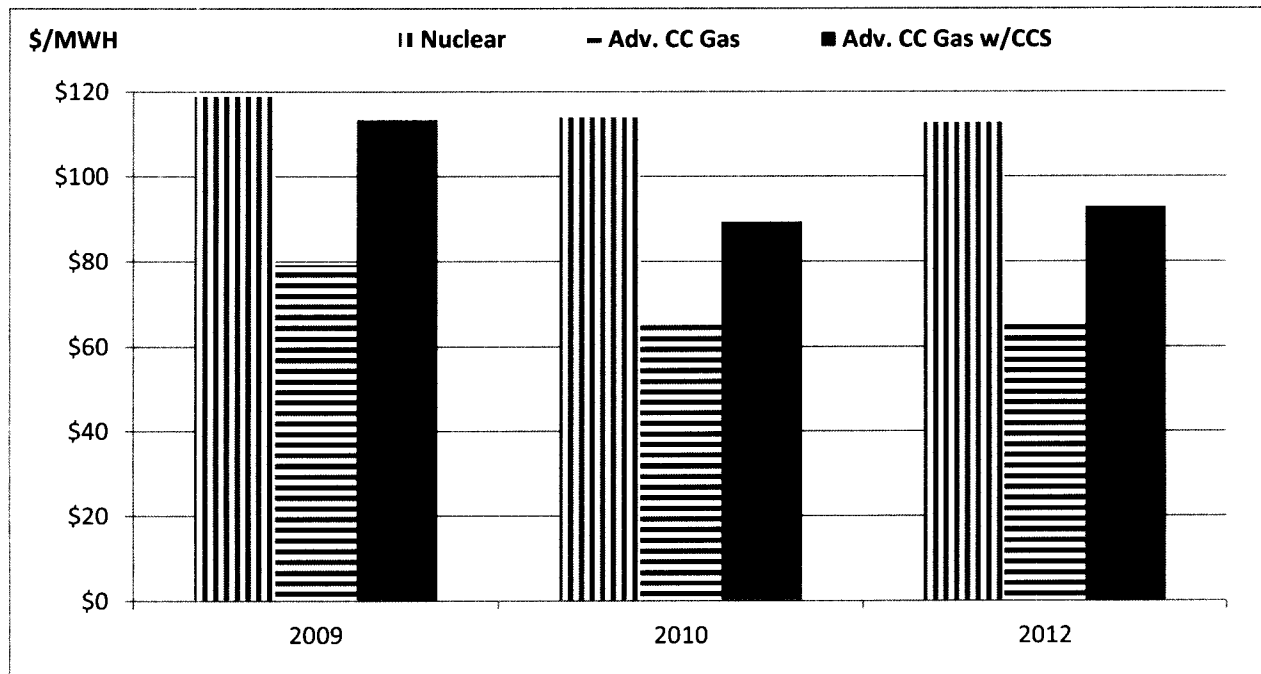
2008 Base Case

**CURRENT GAS PRICES DRAMATICALLY ALTER THE DISTRIBUTION OF OUTCOMES**

<b>Change in Levelized Rev. Req.: Gas Strategy Minus Nuclear Strategy</b> <b>Positive Entries Represent Nuclear Advantage in Millions of Dollars</b>											
<b>CO<sub>2</sub> Price / Escalation</b>	<b>\$0</b>	<b>\$5</b>	<b>\$10</b>	<b>\$15</b>	<b>\$20</b>	<b>\$25</b>	<b>\$30</b>	<b>\$35</b>	<b>\$40</b>	<b>\$45</b>	<b>\$50</b>
<b>0%</b>	<b>-87</b>	<b>-75</b>	<b>-63</b>	<b>-51</b>	<b>-40</b>	<b>-28</b>	<b>-16</b>	<b>-5</b>	7	19	31
<b>2%</b>	<b>-87</b>	<b>-71</b>	<b>-55</b>	<b>-39</b>	<b>-23</b>	<b>-7</b>	9	25	41	57	73
<b>4%</b>	<b>-87</b>	<b>-64</b>	<b>-42</b>	<b>-20</b>	2	24	47	69	91	113	135
<b>5%</b>	<b>-87</b>	<b>-60</b>	<b>-34</b>	<b>-7</b>	19	45	72	98	124	151	177
<b>6%</b>	<b>-87</b>	<b>-55</b>	<b>-24</b>	8	39	71	102	134	165	197	228
<b>8%</b>	<b>-87</b>	<b>-41</b>	5	50	96	141	187	233	278	324	369
<b>10%</b>	<b>-87</b>	<b>-19</b>	48	116	183	250	318	385	453	520	587

Source: Exhibit H (Lynch, 2008, Exhibit JML-2), p. 11.

## EIA Estimates of Levelized Cost of Generation Resources in Annual Energy Outlook



Value of cost difference at 90% capacity factor and 40 year reactor life (Billions):

	Nuclear vs. Advanced Combined Cycle Gas	
	No Carbon Capture	With Carbon Capture
2009	\$15.4	\$2.2
2010	\$19.7	\$9.5
2012	\$18.3	\$8.0

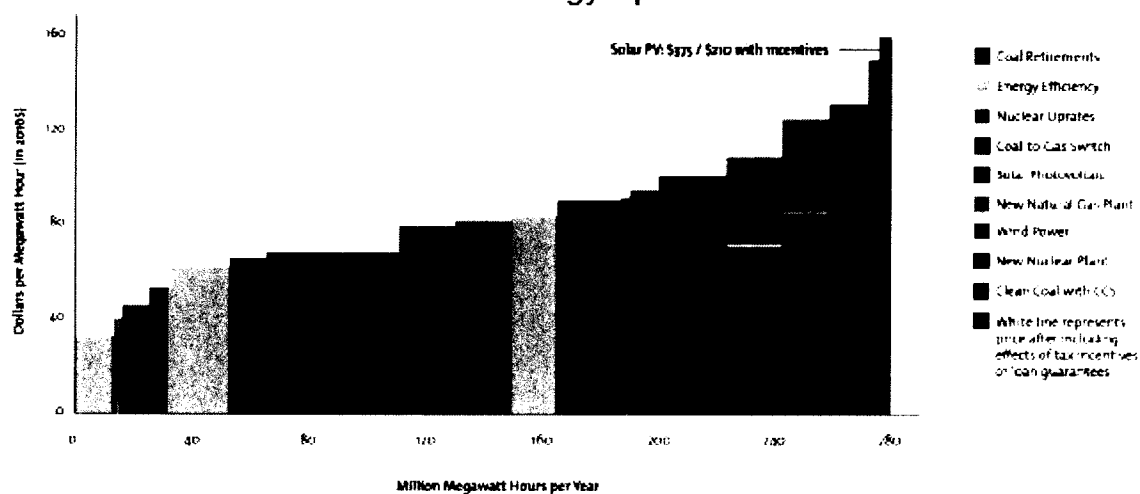
Source: Energy Information Administration, *Levelized Cost of New Generation Resources*, various years.

## PJM Generation Resource Cost Curve

## There are Cheap Ways and Costly Ways to Clean the Generation Fleet

5

### Levelized Cost of Clean Energy Options in PJM

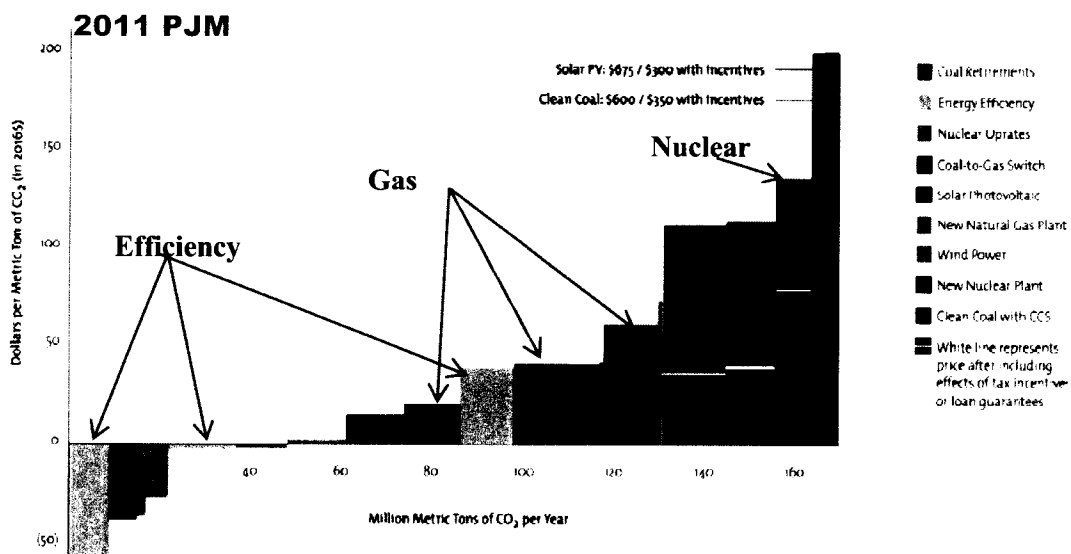
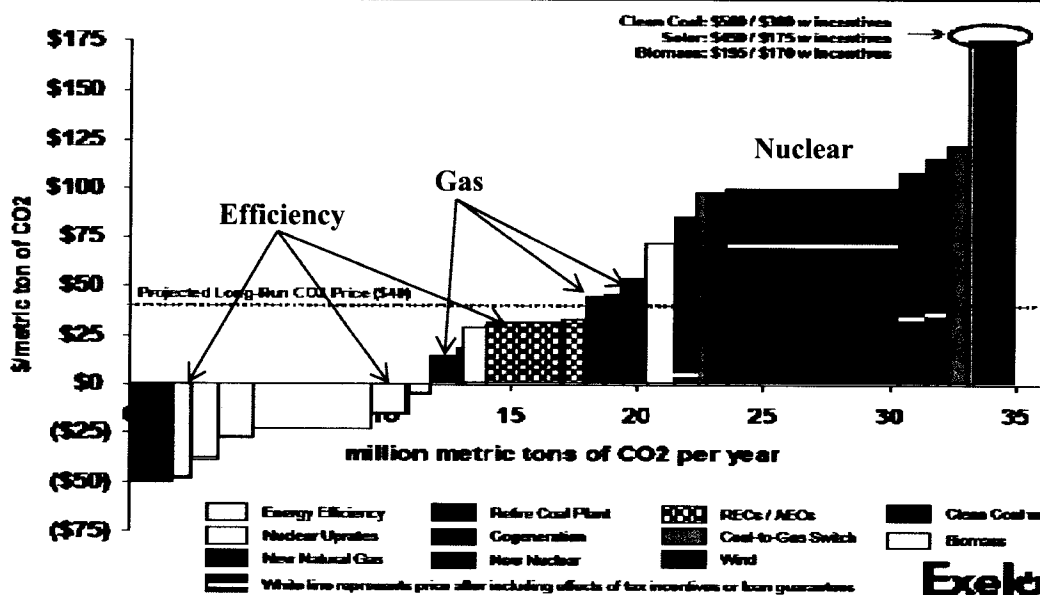


Note: Applies to the marginal abatement of the generation portfolio and does not include transmission.

Technology cost assumptions are based on the  
 combined gas turbine (CGT) and solar  
 wind (CWT) costs.  
 Nuclear Upgrades: \$100/MWh  
 Clean Coal with CCS: \$100/MWh  
 Solar Photovoltaics: \$375/MWh

Source: John Rowe, *Energy Policy: Above All, Do No Harm*, American Enterprise Institute, March 8, 2011

## Evaluating Options in terms of the Cost of Carbon Reductions

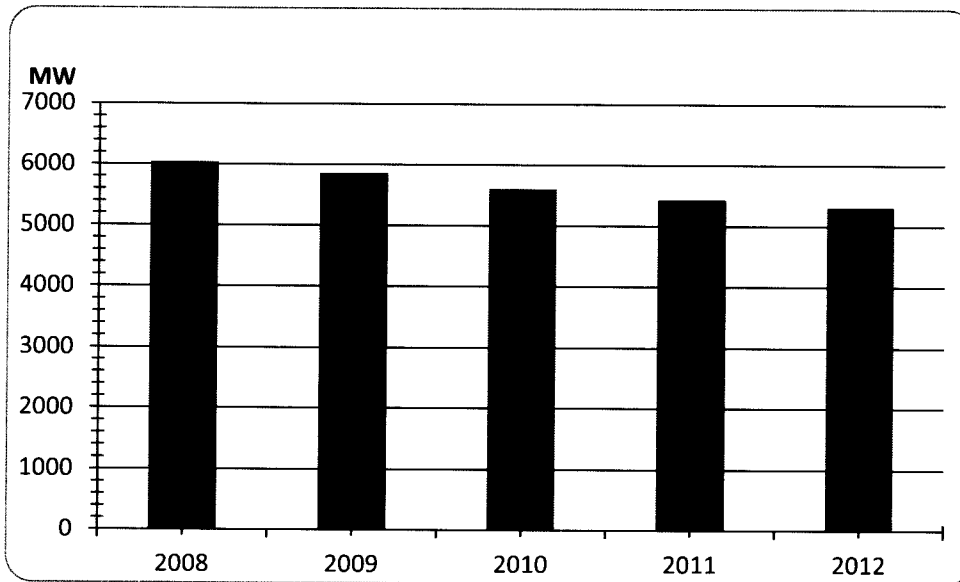
**Exelon's View of Carbon Abatement Options – 2010**

Sources: Rowe, John, *Fixing the Carbon Problem without Breaking the Economy*, Resources for the Future Policy Leadership Forum Lunch, May 12, 2010; *Energy Policy: Above All, Do No Harm*, American Enterprise Institute, March 8, 2011



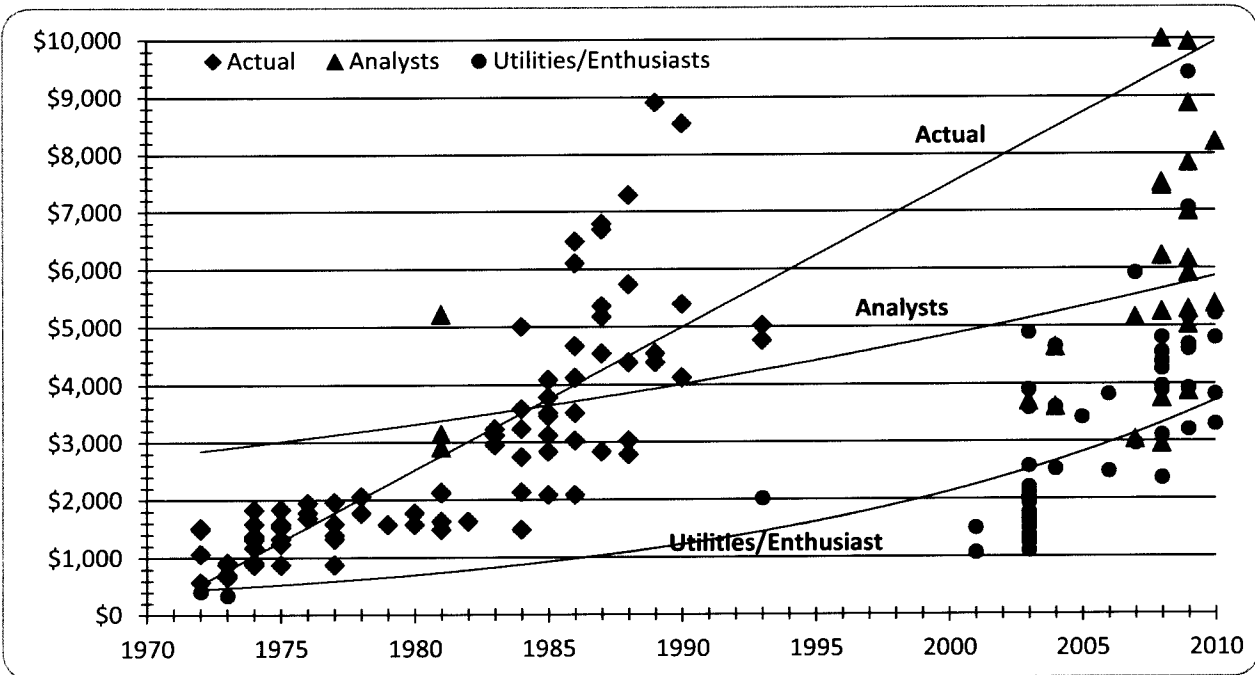
**Exhibit MNC-9**

**Total Firm Peak Power Projections Since Certification**



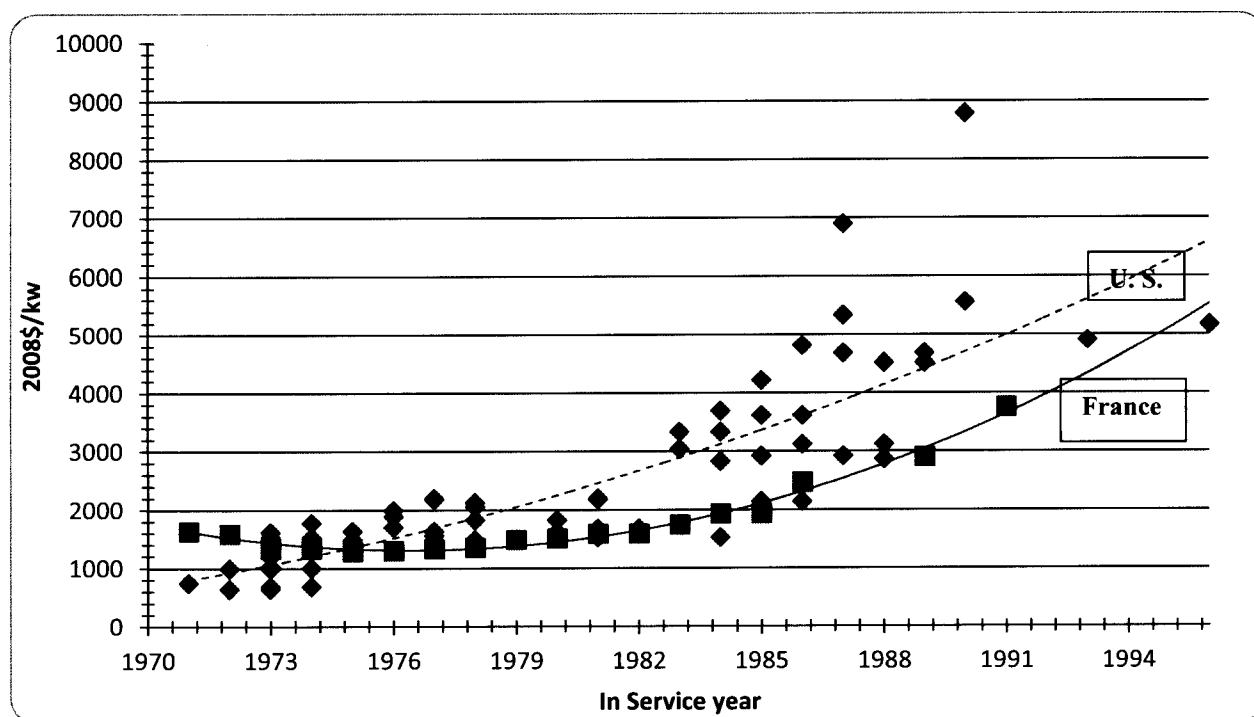
**Sources: 2008: Exhibit H (Lynch, 2008, Exhibit JML-2); S.C. Coastal, Conservation League, et al., South Carolina Electric & Gas, Integrate Resource Plan, Docket No. 2012-9-E, Table 1.2009-2012.**

## Overnight Construction Cost per KW, in \$2010



Source: Mark Cooper, "Nuclear Safety and Affordable Reactors: Can We Have Both?," *Bulletin of the Atomic Scientists*, 68(2), 2012, p. 63.

## OVERNIGHT COSTS OF PRESSURIZED WATER REACTORS (2008\$)



Source: Mark Cooper, *Policy Challenges of Nuclear Reactor Construction: Cost Escalation and Crowding Out Alternatives*, Institute for Energy and the Environment, Vermont Law School, September, 2010; Arnulf Grubler, *An Assessment of the Costs of the French Nuclear PWR Program: 1970-2000*, International Institute for Applied Systems analysis, October 6, 2009.